SCIENCE LIBRARY

15 Cents

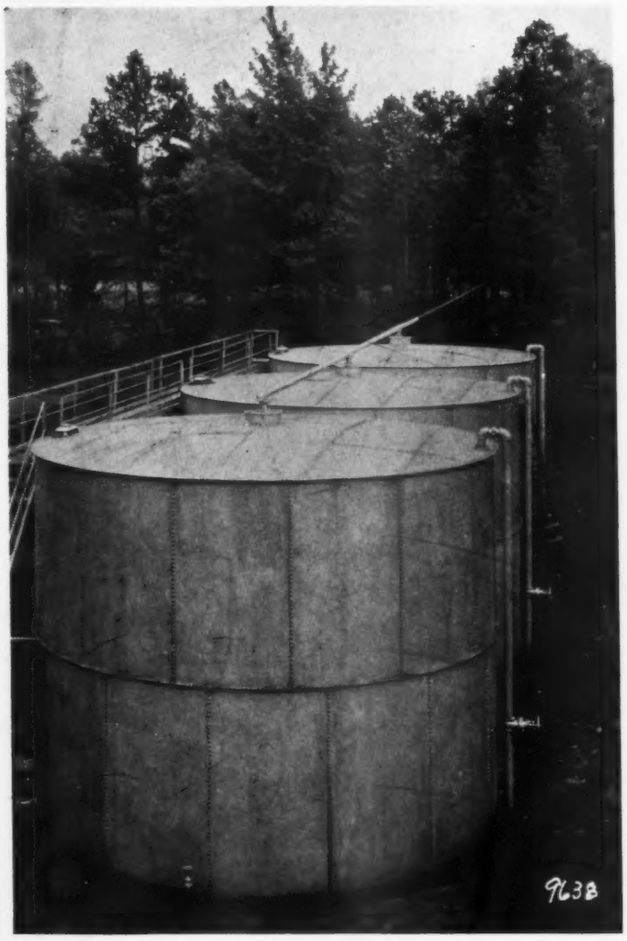
The OIL and GAS JOURNAL

PRODUCING REFINING PIPELINE ENGINEERING MARKETING

Published Every Thursday TULSA, OKLAHOMA, OCTOBER 6, 1932 Subscription $6.00 a Year

OCT 10 1932

University of Michigan, General Library, Ann Arbor, Mich.



MADE OF AMERICAN

Three 1,000-Bbl. Maloneys used by Superior Oil Corp. of California in the Gladewater, Texas, Field. S. S. Staley Tank Co., Distributer, Tyler, Texas.

"Alone in Quality"

MALONEY TANK MFG. COMPANY

38 N. Peoria Ave., Tulsa, Oklahoma

Distributers at All Principal Petroleum Points

Packed in Steel-Bound Crates for Export

FOR 20 Years Maloney Bolted Steel Tanks have been outstanding for Economy in Lease Storage

Today Maloney *Vapor-Pressure* Flow and Stock Tanks are the last word in efficient and lasting service. These tanks are made of not less than 12-gauge rust-resistant Keystone Copper Steel. Reinforcement is with heavy 2" angles, with wide gussets on ties and ladders. Efficient combination valves, operating at 16 ounces pressure and ½ ounce vacuum, restrict the movement of vapors.

Our aluminum paint, made with a spar vehicle containing water-proof and alkali-proof Inhiburine, is especially durable.

MALONEY PATENTED BOLTED COPPER-STEEL TANKS MALONEY

A small valve that fills a big need . .

Soundly engineered, of course—this is a Chapman Valve. Look over these specifications:

BODY—Rugged, strong construction throughout. Perfectly machined. Ports are threaded United States Standard.

CAP—Solid stock, perfectly machined, with large packing space.

SPINDLE—Made in *one piece* from high grade rolled stock, fully machined and with accurately seated disc point.

PACKING NUT—Machined from solid rod—has deep packing chamber.

GLAND—Rugged construction, made from solid stock and with deep packing chamber.

PACKING—High grade asbestos packing.

HAND WHEEL—Notched, non-heating, easy to grip.

The new CHAPMAN Needle Type Valve *List 666*

Made in ¼ to ¾ inch pipe sizes, in both globe and angle types. . . .

For pressures of 1500 to 3000 lbs. . . .

Temperatures up to 700 deg. F. . . .

Stocked in these metals: Solid bronze . . . Carbon steel . . . Monel . . . KA2S . . . Stainless steel . . .

Ask for full details at any Chapman branch office—or write us direct.

The CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD, MASS.
Valves for the oil industry carried in stock at
Los Angeles—1725 E. Seventh St. San Francisco—508 Fourth St. Houston—2610 Bell Ave.
Other Branch Offices: Pittsburgh Detroit Cleveland Atlanta Philadelphia Chicago Syracuse New York Boston
Distributors:
TAUBMAN SUPPLY CORPORATION
General Offices: Tulsa, Oklahoma
THE PEDEN COMPANY
Houston, Texas

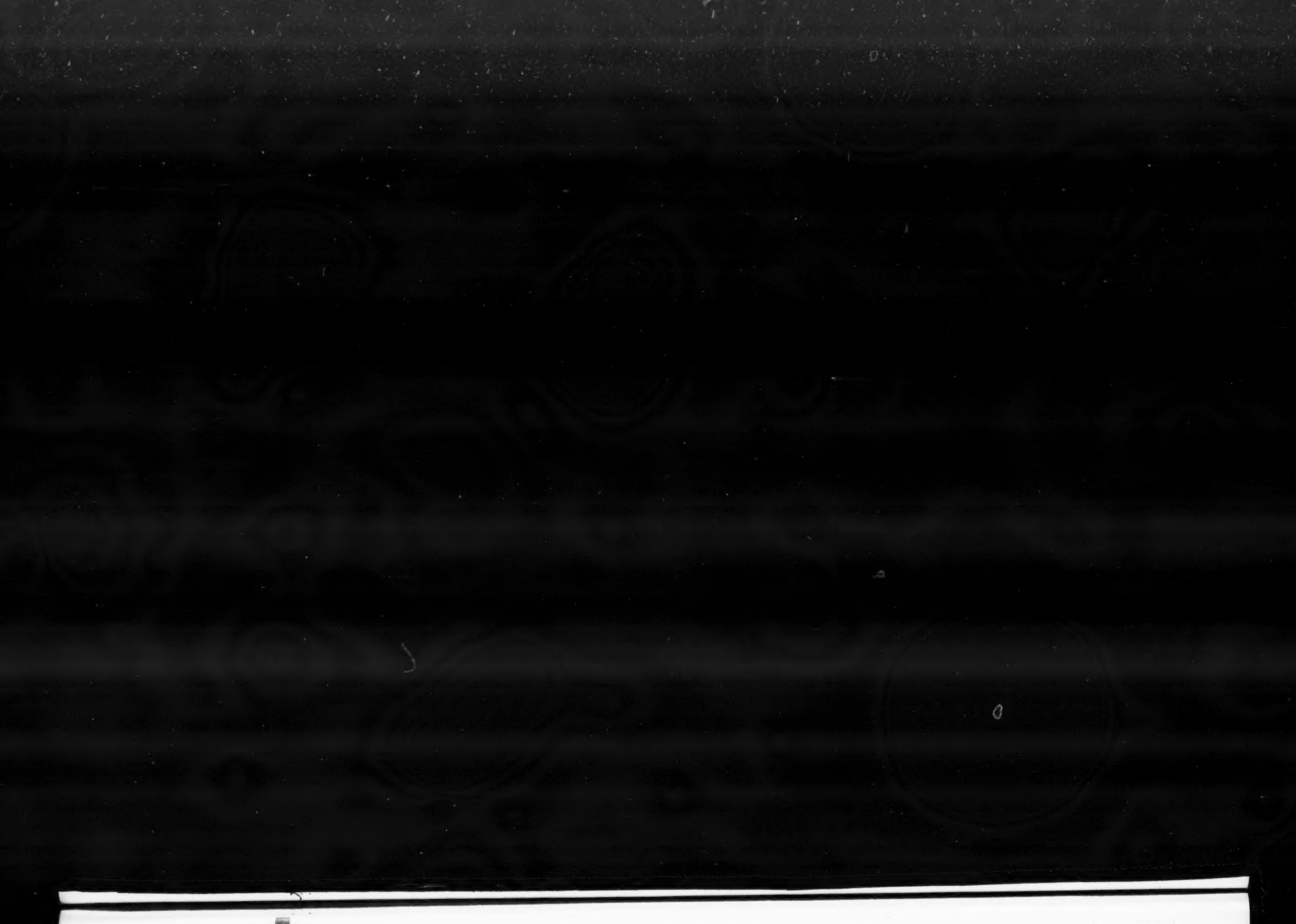


TABLE OF CONTENTS

Vol. 31 THE OIL AND GAS JOURNAL, October 6, 1932 No. 20

Special Articles

Crude Oil Price Structure Will Be Maintained If Production Is Curtailed to Market Demand ---- 7
By ANDREW M. ROWLEY

Legal and Engineering Aspects Discussed at Ponca City ---- 8-9
By L. G. E. BIGNELL

New Jersey May Take Over Gulf South American Properties ---- 9
By A. E. MOCKLER

More Frankness in Discussing Proration and Prices Urged ---- 10-11
By J. HOWARD MARSHALL

National Program for Oil Industry ---- 12-13
By W. S. FARISH

Antiknock Testing Method Correlating Laboratory and Road Data ---- 16

Don't Lose Step (Editorial) ---- 18

Mid-Continent Section A.S.M.E. Meeting ---- 30

American Companies May Revive Mexican Activity in Exports ---- 31
By A. E. MOCKLER

Oil and Gas Content as Standard of Rights in Pool ---- 32
By E. H. GRISWOLD

Applying Subsurface Pressure Determinations ---- 36
By D. G. HAWTHORN

New Hypothesis for Calculating Pressure Drops ---- 45
By T. V. MOORE and R. J. SCHILTHUIS

Reservoir Energy, Its Source and Utilization ---- 52
By JOSEPH B. UMPLEBY

Remarks Prepared by W. P. Z. German ---- 52

Remarks Prepared by F. O. Pryor ---- 56

Limitation to Market Demand—Legislative Confusion 54
By ROBERT E. HARDWICKE

Selection of Ferrous Metals for Refinery Use ---- 57
By E. C. WRIGHT

Osage Lease Sale ---- 60

Service on New Fields—Perry Area ---- 61-63

Field Problems From Readers ---- 98
Edited by THOMAS F. SMILEY

Field Operations

Late Fields ---- 31

East Texas ---- 65-66
By L. E. BREDBERG

West and North Texas ---- 67
By L. E. BREDBERG

Oklahoma ---- 73
By W. A. SPINNEY

Kansas ---- 75
By W. A. SPINNEY

Gulf Coast ---- 77
By NEIL WILLIAMS

California ---- 78
By L. P. STOCKMAN

Central West ---- 80
By GEORGE A. WHITNEY

Eastern Fields ---- 80
By STAFF CORRESPONDENT

North Louisiana-Arkansas, Mississippi ---- 82
By J. R. CRUMPTON

Southwest Texas ---- 83
By B. D. STEVENSON

Rocky Mountain Area ---- 84
By TOLBERT R. INGRAM

Canada ---- 85
By VICTOR LAURISTON

Michigan ---- 86
By GEORGE A. WHITNEY

Refining and Marketing

Oklahoma Gasoline Quotations Continue Decline ---- 20
By C. O. WILLSON

A. P. I. Refinery Report ---- 21

Developments in Chicago More Cheerful ---- 22
By ROBERT C. CONINE

New England Markets Follow Jersey Cut ---- 23
By A. E. MOCKLER

Refinery and Crude Prices ---- 24-25

Tank Wagon Markets ---- 26

News for Sales Departments ---- 27

News for Petroleum Refiners ---- 28

Natural Gasoline Manufacture ---- 29

Technical Questions Answered ---- 100
By C. K. FRANCIS, PH. D.

General Departments

Personal Paragraphs ---- 94

Natural Gas Developments ---- 96

New and Improved Equipment ---- 101

Crude Petroleum Statistics ---- 102

Classified Advertising ---- 103

Index to Advertisers ---- 104

Refinery Section Starts on Page 20

Branch Editorial Offices

CHATHAM, ONTARIO, CANADA, Victor Lauriston, 35 Stanley Avenue. CHICAGO, ILL., Robert C. Conine, Room 1416, 6 North Michigan Avenue. DENVER, COLO., Tolbert R. Ingram, 130 State Office Building. FORT WORTH, TEXAS, L. E. Bredberg, 601 Petroleum Building. HOUSTON, TEXAS, Neil Williams, 1116 Second National Bank Building. LOS ANGELES, CALIF., L. P. Stockman, 522 Union Oil Building. MUSKEGON, MICH., Paul A. Elliott, Chronicle Office. NEW YORK, N. Y., A. E. Mockler, Suite 2803, No. 19 Rector Street. OIL CITY, PA., Leon H. Walter, Oil City Derrick. SAN ANTONIO, TEXAS, B. D. Stevenson, 1504 Milam Building. SHREVEPORT, LA., J. R. Crumpton, 540 Ricou Brewster Building. TOLEDO, OHIO, George A. Whitney, Box 98, Main Post Office. WASHINGTON, D. C., Charles E. Kern, 606 District National Bank Building.

Branch Advertising Offices

CHICAGO, ILL., C. R. Farmer, 6 North Michigan Ave., Room 1416.
HOUSTON, TEXAS, Neil Williams, 1116 Second National Bank Building.
CLEVELAND, OHIO, Howard Markt, 802 Leader Building.
NEW YORK, N. Y., C. L. Cain, 415 Lexington Ave.

Terms of Subscription

(By Mail, Postage Prepaid)

Current Issue - - - - - - - $ .15	Six months - - - - - - - - $3.00	One year (in Canada) - - - - $7.00
Three months - - - - - - - $2.00	One year (in United States) - - $6.00	One year (foreign countries) - - $7.00

Copyright, 1932, by The Petroleum Publishing Co.

UNITED NORTH & SOUTH DEVELOPMENT CO.
1738-46 MILAM BUILDING
SAN ANTONIO, TEXAS

September 27, 1932.

TO WHOM IT MAY CONCERN:

With the completion of our Stoddard No. 1 well at Buckeye, Matagorda County, Texas, which blew in August 31, 1932, and was brought under control September 6, we believe we have discovered a dome of major importance to the oil industry.

We have under lease a block of approximately ten thousand acres, the fee of which is in comparatively few owners. This makes possible the development of the property in a scientific and orderly manner. If, as is estimated by leading authorities, the visible supply of oil in this country is sufficient for only ten years, oil in the ground —under the conditions existing at Buckeye—constitutes a most valuable reserve.

As a number of companies have expressed an interest in our Buckeye property, we have decided to offer it for sale, giving all parties a just, fair and equal opportunity to secure it.

The Frost National Bank of San Antonio, Texas, will receive up to One o'Clock P. M., Central Time, October 27, 1932, all bids for the purchase of our leasehold mineral rights, our discovery well, and production equipment located on the property. Our minimum price is Twenty Million Dollars—not less than Ten Million Dollars in cash or its equivalent in acceptable securities, and not less than Ten Million Dollars payable out of one-fourth of seven-eighths of the first production of oil, gas or other minerals obtained from the property. Only such bids as are accompanied by a certified check for One Hundred Thousand Dollars will be considered.

This offer of sale is made in good faith, but we reserve the right to determine which bid is to the best interests of the Company and to reject any and all bids.

A seismograph survey by the reflection method, and a torsion balance survey, are now being made of the property by leading independent geophysical exploration companies, the results of which will be available to prospective purchasers.

Detailed information on the property, together with oil analyses, maps, logs, geophysical, geological and paleontological data, may be obtained by applying to the Company's officials at 1746 Milam Building, San Antonio, Texas.

We will be glad to assist in any investigation of the property which a prospective buyer may care to make.

No commissions or brokerage fees or charges will be paid to anyone by this Company.

Faithfully yours,

UNITED NORTH & SOUTH DEVELOPMENT COMPANY,

By Edgar B. Davis,

President.

Crude Oil Price Structure Will Be Maintained if Production Is Curtailed to Market Demand

By ANDREW M. ROWLEY

MORE consideration should be given at this time to the facts underlying the present uncertainty regarding the outlook of the crude oil price structure and less to possible future actions of state regulatory bodies and their employes. If more crude oil is produced than the market will absorb, a weakened price structure is a natural result and that condition certainly will obtain under those circumstances.

Further curtailment of output is necessary. Just how successful any additional orders curbing production in different areas might be in achieving this object remains to be seen. Extreme doubt is expressed by many men in close touch with conditions in East Texas as to the success of efforts there to prevent illegal production and the stealing of crude oil. Operators in other fields are opposed to further curtailment of their production and any orders affecting these fields might be tied up in litigation.

Public opinion is a powerful factor in any situation but the question of maintaining the present crude oil price structure will be determined solely on the basis of available supply and demand. Illegally produced or stolen crude oil reaching markets is just as much a factor as that brought to the surface legally and counted in the production column. The situation in East Texas has been likened to enforcement of prohibition. It must be admitted that low salaried employes are under a great temptation.

There is no basis for the impression that certain large companies desire a reduction in crude oil prices. Any such cut would be reflected in lower prices for refined products and the income from refined products is regarded as of greater importance than the price paid for crude oil. A very large majority of executives are anxious to maintain the present price schedule and would be more than willing to increase prices if conditions warranted such action.

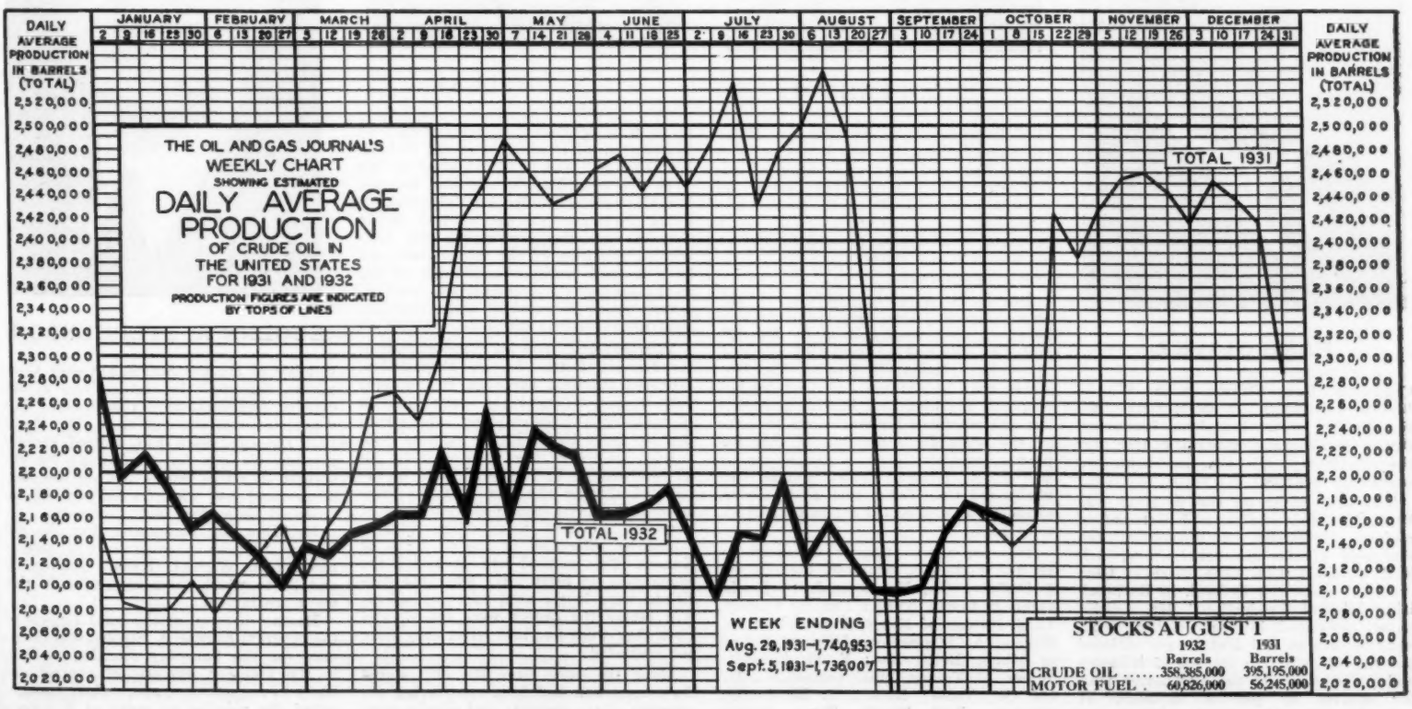
Many attach considerable importance to the meeting to be held in Austin on Saturday of this week. Public agitation may prevent action reducing the allowable in East Texas to a figure best calculated to stabilize conditions and conserve the resources of that field. And, as stated above, there is considerable opposition to further reductions in other Texas fields. But the fact remains production must be curtailed further.

Crude Oil Production in the United States

Estimated daily average production for the week ending October 1, and a comparison with previous week and one year ago, follows:

	Oct. 1	Sept. 24	Oct. 3, 1931
Oklahoma—			
Oklahoma City	70,455	71,235	20,910
Seminole-St. Louis	109,260	111,610	57,105
Remainder of State	206,405	207,120	195,120
Total Oklahoma	386,120	389,965	273,135
East Texas—			
Lathrop	146,105	144,985	96,468
Kilgore	112,541	113,702	148,463
Joiner	120,562	112,796	136,465
Total East Texas	379,208	371,483	381,396
West Texas	170,327	169,847	203,805
North Central Texas	73,643	72,416	76,904
Texas Panhandle	44,010	46,635	64,187
East Central Texas	52,051	53,953	57,259
Gulf Coast Texas	137,212	139,478	118,330
Southwest Texas	58,936	59,260	61,215
Total State of Texas	915,387	913,072	963,096
Kansas	99,915	100,820	107,210
North Louisiana	30,100	29,720	29,185
Gulf Coast Louisiana	33,586	34,345	26,507
Arkansas	34,395	34,025	37,625
Eastern fields	114,000	114,000	115,000
Rocky Mountain area	72,197	73,294	90,984
California—			
Santa Fe Springs	59,750	58,750	60,500
Long Beach	71,500	71,500	76,750
Playa Del Rey	14,250	14,250	20,500
Elwood	13,750	14,000	25,000
Kettleman Hills	59,000	59,750	59,750
Remainder of State	256,750	261,750	250,250
Total California	475,000	480,000	492,750
Total United States	2,160,700	2,169,241	2,135,492

Decrease 8,541 Bbls. Daily



Legal and Engineering Aspects of Oil Industry Problems Discussed at Ponca City Meeting

By L. G. E. BIGNELL
Petroleum Engineering Editor

It was the unanimous opinion of more than 200 members and guests of the Petroleum Division of the A.I.M.E. who attended the Ponca City, Okla., meeting of the division on September 30 and October 1 that it was one of the best arranged and conducted sessions ever held. The place of meeting was ideal as the Continental Oil Co. turned over to the Institute its Conoco Club located northeast of the city. This organization's club house, dormitory, golf club and garage were available for the meetings, meals and sleeping quarters, and there was no necessity for visitors to leave the grounds during the two days' session.

The Institute is indebted to the Continental Oil Co. for this courtesy and particularly to its president, D. J. Moran; Gen. B. H. Markham, comptroller; E. O. Bennett, chief engineer; E. H. Griswold, petroleum engineer, and many others, as well as Earl Oliver, chairman of the Petroleum Division, for selecting this spot for the fall meeting of the division.

The first session was called to order at 9:30 a.m., Friday, September 30, by

EARL OLIVER

Chairman Earl Oliver, with W. E. Wrather presiding. It dealt with "Rationalization of the Petroleum Industry." James J. Cosgrove, general counsel for the Continental Oil Co., made the introductory address.

The first paper on the program was by C. K. Leith, chairman department of geology, University of Wisconsin, and chairman of the Mineral Inquiry, A.I.M.E. It dealt with "The Place of Government, State and Federal, in Rationalizing Mineral Production." Mr. Leith's paper, published in the October, 1932, issue of Mining and Metallurgy, outlined the rise of collective control of industry and its causes, and the alternative plan for control by private interests. It pointed out revisions which might better divide this control between the Government and private interests.

W. S. Farish, president, Humble Oil & Refining Co., Houston, Tex., was the next speaker. His paper, "A Rational Program for the Oil Industry," is printed in full in this week's issue of The Oil and Gas Journal.

Friday Afternoon Session

After a lunch at the club, A. W. Ambrose, vice president, Empire Companies, Bartlesville, Okla., called the afternoon session to order. E. O. Bennett acted as vice chairman. This session continued on the general subject of rationalization and E. H. Griswold presented the first paper, "Recoverable Oil and Gas Content of Land as Suitable Standard of Each Owner's Rights." This paper is published on page 32 of The Oil and Gas Journal.

Mr. Griswold's paper created considerable discussion upon some phases of his recommendations. He said it did not present a final and complete solution of this difficult problem but he felt that it did present certain basic facts that might well serve as the starting point for a program of allocating to each landowner his proportionate share of the oil and gas in a common pool.

E. O. BENNETT

Dr. J. B. Umpleby, petroleum engineer, Norman, Okla., read his paper published in this week's issue of The Oil and Gas Journal on page 52, entitled, "Reservoir Energy." Doctor Umpleby stated that he did not feel that he had proposed anything new in his statements but had set forth his arguments to serve as the basis for discussion of this important problem. Written discussions by W. P. Z. German, chief counsel for Skelly Oil Co., Tulsa, and F. O. Prior, president, Stanolind Oil & Gas Co., Tulsa, were read.

The paper was further discussed by H. D. Wilde, Jr., engineer, Humble Oil & Refining Co., Houston; J. O. Lewis, Dunn & Lewis, Tulsa; Ben E. Lindsly, U. S. Bureau of Mines, Bartlesville; Dr. Eugene A. Stephenson, Missouri School of Mines, Rolla, Mo.; E. O. Bennett; James A. Veasey, chief counsel, Carter Oil Co., Tulsa; Robert E. Hardwicke, attorney, Fort Worth, Tex.; Walter Miller, vice president, Continental Oil Co., and others.

Discussed From Many Angles

The problem was discussed from many angles and many suggestions were offered as to means of evaluating the energy contained in the reservoir. Doctor Umpleby emphasized the need for considering "reservoir energy" made up of several different types of energy rather than confining consideration to "gas energy" alone. There has been considerable tendency to discuss "gas energy" as though it were the one important type of energy available in an oil pool whereas it has been pointed out many times that the work of moving oil to the well and to the surface may be accomplished by the use of several types of energy common to every pool.

The next paper on this part of the program was by Robert E. Hardwicke, on "Limitation of Production of Oil to Market Demand," and it is published in this week's issue of The Oil and Gas Journal. Mr. Hardwicke handled his subject in his usual thorough style and showed clearly that the attorney can master the engineering problems of the oil industry and have a good working knowledge of the mechanics of oil accumulation and recovery which is valuable when applying legal restrictions to oil pools.

J. B. UMPLEBY

Thurman Hill, Topeka, commissioner of the Kansas Public Service Commission, delivered the next paper on this general subject and reviewed the work done in Kansas by the commission. He stated that no order issued by the Kansas commission had ever been contested by an oil company or by the public and he attributed this to the fact that the commission had been counseled by a body of practical oil men representing various companies interested in the oil fields of Kansas. This method had permitted the commission to learn first what the conditions were in the area under consideration before the orders were issued, and after they were put into effect they were not contested.

Along the same lines Mr. Hill stated the commission had been considering the interests of the property and royalty owners because he was convinced that the property owners were interested in the size of the royalty check more than in the technical details of operating the field and wells.

Friday Evening Session

Vice President Charles Curtis attended a dinner in the club dining hall and made a brief address. He brought to the members of the A.I.M.E. the greetings of President Hoover, a former president of the institute.

The first paper of the evening, presented by J. Howard Marshall, assistant to the dean and instructor in the Yale School of Law, New Haven, Conn., was entitled, "Developing United Action and Public Support."

Mr. Marshall contended that it is no longer good policy for the industry to keep the matter of price in the background of its arguments for conservation because this nation is dependent upon its own supply of crude petroleum and if this supply is dissipated the results will be a later increase in the price of finished products.

The second paper on the evening program was by Northcutt Ely, executive assistant to the Secretary of the Interior and chairman of the Federal Oil Conservation Board, Washington, D. C. The paper was entitled, "The Interdependence of the States in Oil Conservation."

Warwick M. Downing, Denver, Colo., member of the Oil States Advisory Committee, delivered the last address of the evening and dealt with the work of this committee and its objectives. He stated that the committee had drafted general recommendations for regulations for the several oil states represented on the committee and had also framed an act introduced into the last Congress.

EUGENE A. STEPHENSON

Mr. Downing announced that the Oil States Advisory Committee will hold a meeting in Wichita, Kans., October 23 and 24 to which those interested in this work are invited.

Having disposed of the legal aspects of the program Eugene A. Stephenson, chairman for the Saturday morning session, in the industry left out of control are likely to countenance, and, rightly enough, called the meeting to order at 9 o'clock

for the purpose of discussing technical problems. Carroll V. Sidwell, petroleum engineer Amerada Petroleum Corp., Seminole, Okla., was vice chairman for this session.

The first paper scheduled was on "Appraisal of Various Methods of Proration," but because the several engineers who had been asked to prepare this type of paper had been unable to do so Doctor Stephenson asked several members present to give outlines of the proration methods applied to different pools.

J. R. McWilliams, petroleum engineer

E. H. GRISWOLD

Skelly Oil Co., Tulsa, gave a comprehensive outline of the development of proration in the Oklahoma City Pool. Mr. McWilliams traced the various methods of restricting production to market demand from the early life of the pool down to the present time and indicated the factors that had made each method necessary at the time it was applied and the reason for its later changes.

William V. Vietti, petroleum engineer The Texas Company, Midland, Tex., the next speaker, outlined the regulatory methods that had been applied to Yates Pool, Pecos County, Texas; Upton-Church area, West Texas; Hendrick Pool, Winkler County, Texas; Hobbs Field, Lea County, New Mexico; Howard-Glasscock Pool, Texas, and the Reagan County Field. Mr. Vietti's remarks were supplemented by statements by P. P. Gregory, engineer for the Yates Pool engineering committee.

Robert E. Hardwicke was called upon to outline the proration methods applied to the East Texas area and then there was general discussion of the results obtained in the various districts under consideration.

R. E. Summers, Gulf Companies, Pittsburgh, Pa., read a carefully prepared paper on "Selection and Use of Screened Pipe," by Clifford S. Wilson, engineer, Venezuela Gulf Oil Co., Maracaibo, Venezuela, South America. This paper has been published as T. P. No. 490 by the A.I.M.E. It is an interesting treatise on this important problem and cites many practical results arrived at by actual field experiences.

Water flooding in the Bradford, Pa., Field has long been a subject of much interest to the petroleum industry and it was thoroughly summed up in the paper presented by K. B. Nowels, Forest Oil Corp., Bradford. This paper was entitled, "The Mechanics of Water Movement in Natural and Artificial Flooding of Oil Sands." In conclusion it states:

"It is now definitely known that the fundamental principles and relationships originally outlined by Herold, as applying to the forced drive, hold true, and there is a considerable amount of field evidence to substantiate this.

"Although there is certain to be some deviation from the ideal performance in flooding, nevertheless the fundamental relationships are not destroyed.

"Flood wells that are operated in pairs have elliptical shaped flood zones. Wells operated singly, such as in the detailed production program, have circular shaped zones.

"Providing the proper pressure for complete practical coverage of a five-spot has been used. The zone of stress is an approximate square or diamond lying within the ellipse which extends between the water-intake well and the producing oil well. These square or diamond shaped zones influence the type of production curve of any particular flood.

"If less pressure than necessary for complete coverage is used, the zone of flood is a slender shaped diamond or a six-sided rhombohedron shaped figure within the ellipse.

"Complete areal coverage of the five-spot area can be had by using a pressure on the face of the sand which is twice the value of the frictional resistance between wells. Usually, however, a pressure twice the value of this resistance is impractical and instead a factor of 1.6 is satisfactory from an economic standpoint.

"The radial flow formula as given in this report, which has been used extensively by engineers of the Gulf Oil Corp., seems to hold true in flooding operations.

"Well spacing in any form of artificial flooding is entirely dependent upon the sand resistance and the pressures which are used in overcoming this resistance.

"Artificial flooding operations cause a conversion to hydraulic control and the fundamental relationships as described by Herold hold true.

"It is believed that any reduction given to the kinetic pressure gradient will assist in reducing the amount of water which is produced by flood wells.

"The delayed drilling and production program is believed to be sound and is recommended.

"In most cases it is believed that flooding efficiency has been rather poor and that large amounts of recoverable oil remain in the ground due to the fact that insufficient pressures have been used in flooding.

"The ellipse theory, in its application to flooding, will clarify the situation with respect to recovery of oil from across lease boundary lines."

ROBERT E. HARDWICKE

The last paper on the Saturday morning session, by T. V. Moore and R. J. Schilthuis, engineers, Humble Oil & Refining Co., Houston, Tex., was on "The Calculation of Pressure Drops in Flowing Wells." It is published in this week's issue of The Oil and Gas Journal, page 45.

Bottom-hole Pressures Discussed

Harry C. Fowler, U. S. Bureau of Mines, Washington, D. C., was chairman and C. V. Millikan, petroleum engineer, Amerada Petroleum Corp., Tulsa, was vice chairman for the Saturday afternoon meeting which completed the technical sessions. This meeting was devoted to bottom-hole pressures and the well prepared paper by David G. Hawthorn, petroleum engineer, Barnsdall Oil Co., Tulsa, entitled, "Subsurface Pressures in Oil Wells and Their Field of Application," was presented by the author. It is published on page 36 of this issue.

The discussion following this paper brought out many suggestions for the application of data secured by instruments in bored holes and showed the great interest aroused in this important subject. Papers of this type are pointing the way to greater advancement in the science of petroleum engineering and are linking together carefully secured facts with the many legal requirements that enter into the problems of unit operation of oil pools.

This meeting will long be remembered by those in attendance as most interesting and instructive and the trend of thought of the attorneys, executives, and engineers on the important problems of the industry at this time show real progress in the right direction, and as a leader in this movement the institute and the industry are fortunate in having Earl Oliver as head of the petroleum division at this time.

The chairman appointed a nominating committee to make up a slate for the petroleum division officers for 1933 to be composed of J. B. Umpleby, chairman, with Harry C. Fowler, C. V. Millikan, R. E. Summers, and A. W. Ambrose acting with him. Their report will be made to the institute headquarters in New York City before December 15.

New Jersey May Take Over Gulf Oil's South American Producing Property

By A. E. MOCKLER
New York Bureau, The Oil and Gas Journal

NEW YORK, Oct. 3.—Standard Oil Co. (New Jersey), which recently strengthened its position in Mexico and South America through the acquisition of the properties of Pan American Petroleum & Transport Co. (Standard Oil Co. of Indiana) in those countries, will shortly undertake a further major program of foreign expansion through the acquisition of the Mexican and South American properties of the Gulf Oil Corp., it is reported in oil trade circles. There has been no official intimation here of any deal along these lines, news coming in private advices from South America.

Gulf Oil Corp., with important properties and production in South America, (notably in Venezuela) through subsidiary companies, has been placed at a disadvantage in its foreign operations recently as a result of the import duties on petroleum and refined products. Gulf has been handicapped in competing with its principal American competitors in South American production, Standard Oil Co. (New Jersey) and Shell, due to the fact that both have refineries in Mexico and in the Dutch West Indies, whereas Gulf is compelled to sell either its South American crude production abroad or ship it into the United States for processing at the Gulf refineries in this country, paying an import duty of 21 cents per barrel. The Gulf refinery at Port Arthur, Tex., has been handling considerable of this foreign crude in recent years, while some of this foreign oil is understood to have been moved to Gulf refineries in the Pittsburgh area.

Formerly a large operator in Mexico, where it has considerable acreage and producing property in the San Isidoro section of the State of Vera Cruz, and an 8-inch pipe line to its export loading terminal on the Panuco River near Tampico, Gulf a year or so virtually stopped further development of its Mexican properties, and concentrated much of its foreign producing activities in Venezuela, where it ranks among major producers. The company also has important holdings in Colombia, including the famous Barco Concession, and has done exploratory work in Panama.

Gulf Properties

Through a subsidiary company, Venezuela Gulf Oil Co., Gulf has a complete producing organization in that country, with an ocean terminal at Paraguano, where the company's crude is loaded into tankers for the Gulf refinery at Port Arthur, Tex. Besides its own important holdings in Venezuela, the company is also developing sizable concessions held by other companies, on a royalty basis, and its production at times during the past year has gone well over 1,000,000 bbls. per month in Venezuela, although operations have been considerably curtailed since the import tax became effective.

South American Gulf Oil Corp., another wholly-owned subsidiary, is developing an extensive concession in the Maracaibo Basin in western Venezuela, under a royalty agreement with another company, and also has two important concessions in Colombia, likewise under royalty agreements, in addition to the Barco Concession, development of which is just getting under way under a special agreement with the Colombian government.

In addition to its important Gulf and South American interests, which have never been completely integrated, Gulf has other important interests abroad, not affected by the reported deal with Standard and including participation in Iraq Petroleum Co., an interest in a large modern refinery which Standard of New Jersey, Atlantic Refining and Gulf are now building at Port Jerome, France, and majority control of the Nobel-Good-Andre group, which markets refined products (largely lubricating oil at last reports) in England, France, Belgium, Germany, Holland and the Scandinavian countries.

Control of Gulf's Mexican and South American properties, either through outright purchase or an operating agreement, would substantially expand the New Jersey Standard company's position in these countries. It would give the Jersey organization, through Tropical Oil Co. and Andian National Corp., Ltd., virtual control over production in Colombia, where Tropical has been operating for years under a special concession, unfettered by the restrictive phases of the Colombian oil laws which have kept operations by other foreign oil interests virtually at a standstill. With the consolidation of the Jersey, Pan American (already owned by New Jersey Standard) and Gulf producing properties in Venezuela, Jersey would become the undisputed principal producer in that country. With its topping plants on the mainland of Venezuela, its large refinery at Aruba, Dutch West Indies, and smaller refineries at other points adjacent to the Caribbean area, Standard of New Jersey and its subsidiary and affiliated companies would be in position to refine the production of Gulf properties at plants in that area, thus avoiding the necessity for long tanker hauls to the United States, and the payment of import duty.

Expansion at Home

The proposed transaction, if consummated, will free Gulf Oil Corp. for a further expansion of its domestic refining and marketing operations. Ever since the imposition of the import tax, rumors have been current regarding plans by Gulf Oil for building a refinery close to its foreign production, either on the mainland of Venezuela or at Port of Spain or some nearby port. Gulf recently announced plans for a $500,000 topping plant on Staten Island, N. Y., adjacent to the Bayonne refining area, but this plant, it is understood, will run principally on Gulf Coast crude.

Lawyer Advocates More Frankness in Discussing Proration, Conservation and Crude Prices

By J. HOWARD MARSHALL
Assistant to the Dean and Instructor in Yale Law School*

It has become the fashion to attribute most of the ills of the oil industry to the stupidity of the law. Starting in the last half of the past centry, American courts developed the rules of the oil business. These rules enacted what has aptly been termed the "law of capture," the free for all rough and tumble chase which gave victory to a few, losses to many, and now a demoralized industry for all. Under these rules there grew up a vicious system of competitive drilling. The location of wells was determined by surface property lines regardless of subsurface contours. The utilization of gas energy was left to the whim of individual producers. Wells were located close to property lines in a wild effort on the part of each owner to get his neighbor's oil before the neighbor got his. One recalcitrant operator has had the power to set the pace of drilling and the spacing of wells for an entire pool. Offset to offset followed offset in a mad scramble among competitors for "more oil now." We heard on every side that the law was to blame. The law dissipated gas energy, the law compelled too rapid production, the law dictated unscientific placement of wells on the geological structure.

But why not be fair to us misguided advocates in the law? The courts in the formative stage of oil and gas law were influenced and limited by a lack of knowledge of elementary oil well mechanics which your engineering forebears had not yet furnished. At a time when scientific men were still disputing whether oil existed in subterranean ponds or underground streams, the supreme court of the first oil-producing state had little choice but to declare that the rule of capture was the only just rule because no one knew what happened 2,000 feet below the surface. Even as late as 1907, in the now famous case of Barnard v. Monongahela Natural Gas Co. (216 Pa. 362), the same court apologetically confessed: "The right of every landowner to drill a well on his own land at whatever spot he may see fit must be conceded. . . . He may crowd the adjoining farms so as to enable him to draw the oil and gas from them. What then can his neighbor do? Nothing, only go and do likewise. This may not be the best rule but neither the legislature nor our highest court has given us any better. No doubt many thousands of dollars have been expended in protecting lines in oil and gas territory that would not have been expended if some rule had existed by which it could have been avoided."

Courts Were Handicapped

I know that most of you will endorse the last sentence of the court's statement and I think most of you will agree that the reason that neither the legislature nor the highest court had furnished a better rule was because scientific knowledge of oil geology had not progressed sufficiently far to furnish one. Courts, in the formative period of oil and gas law, were handicapped as you were handicapped by sadly incomplete knowledge of what has become today, through your scientific progress, elementary principles of petroleum engineering. And I think I am fair in saying that the reason that the original error of the law has been perpetuated longer than the original errors of the scientific men has been because the industry was not sufficiently united within itself to demand that change. As you in the engineering profession have led us to the light and gathered support for your program in your own industry, we in the law have shown and will continue to show a willingness to follow.

Based upon the new scientific data which you have formulated, the law has already made new rules for the business. In litigation culminating in the case of Bandini Petroleum Co. v. Superior Court [52 Sup. Ct. 103 (1931)] the U. S. Supreme Court has recognized, in theory at least, that gas energy is a common attribute of an oil reservoir which should be used to its greatest advantage by being treated as a single combined force. The recent decision of the Supreme Court of the United States in Champlin Oil & Refining Co. v. Oklahoma Corporation Commission clearly enunciated the doctrine that the state can legislate to assure each producer a reasonably proportionate share of the oil in the common reservoir. Thus the rule of proportionate taking under which each landowner is entitled only to some reasonable proportion of the oil in the common reservoir has been legally affirmed and is supplanting the piratical rule of "getting while the getting is good." Finally in Marrs v. The City of Oxford [32 Fed. 134 (CCA 8th 1929)] a Federal circuit court sitting in Kansas sustained an ordinance which eliminated town lot drilling. The Supreme Court of the United States could apparently find no ground for granting certiorari. The case thus points the way to statutes looking to complete unitization of oil pools, and, in my judgment, will assume greater importance as time goes on. It may mark a climax in the development of a law of oil and gas which is, after all these years, based upon sound engineering principles. It seems luminously clear to me that as your engineering men have furnished us more complete engineering data, both state and Federal courts have shown a willingness to support that "better rule" of development for which the early Pennsylvania court expressed a pious hope. Indeed, the first two steps of the cogent program for the petroleum industry summarized by your chairman, Mr. Oliver, in recent issues of The Oil and Gas Journal, are, as a matter of constitutional principle, established: (1) Landowners may be protected in the enjoyment of an amount of oil bearing some reasonable relation to the oil contained in their land; (2) the dissipation of gas energy may be prohibited when it is not utilized as an efficient driving force for the extraction of oil.

The Oliver Program

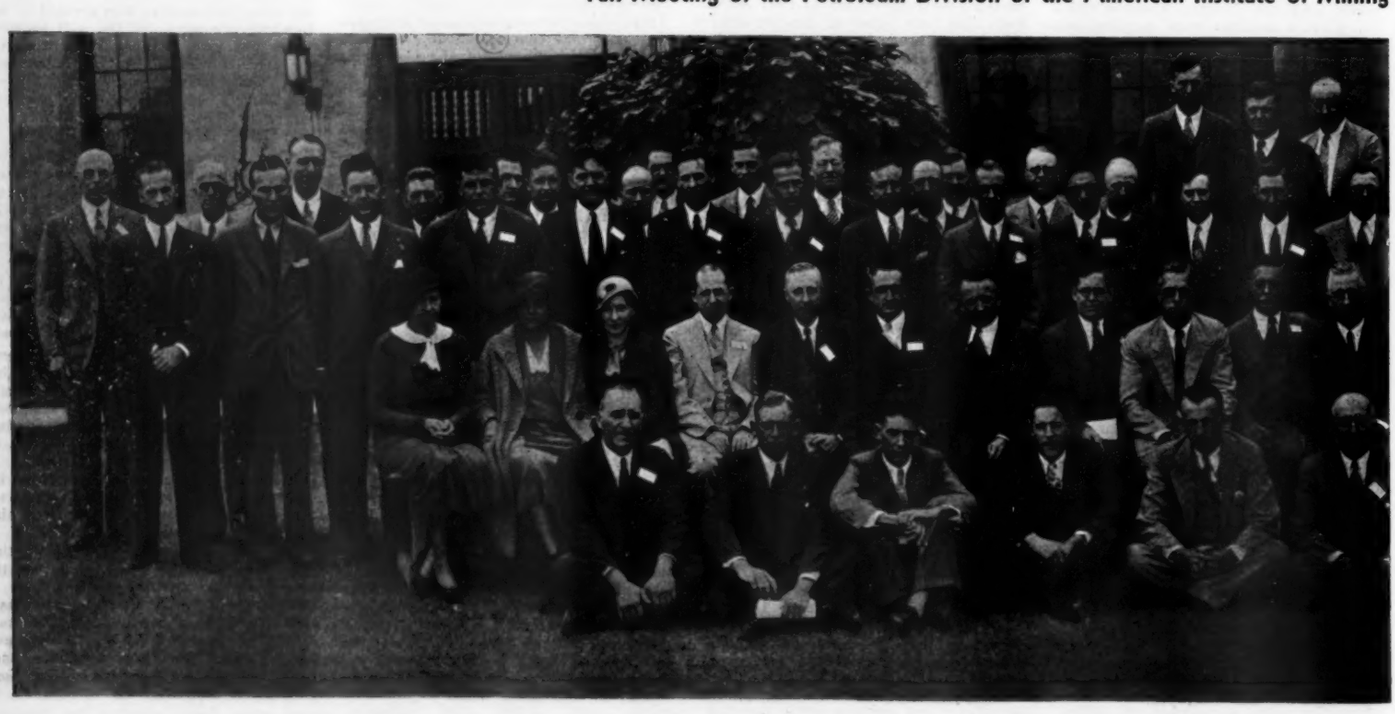
These first two points of the Oliver program set forth the scientific and legal principles of future production. If legislation permitting, or perhaps compelling, scientific production either by way of proration or complete unit operation, concerned only the elimination of actual physical waste, I believe it would be an easy matter to secure united action and public support. But the balance of the Oliver program, equally essential and perhaps more important, opens further questions which you in the industry must face squarely. For it is as obvious that there has been an excess of production as that there has been waste in production. Even if we did secure complete scientific operation of all oil pools, paradoxically enough an unrestrained program of mere scientific exploitation might so increase our present potential supplies of crude oil as to further demoralize the industry. To prevent this, the Oliver program rightly goes beyond the mere establishment of scientific means of production and seeks to control the rate of that production. It seeks to equate production to market demand.

Market Demand and Price

Market demand—what does this mean? As one reads some of the industry's statements to the public attempting to define it as a mere "gauge of production," one

*Prepared in collaboration with Norman L. Meyers, associate attorney, Federal Power Commission, Washington, D. C. Presented at fall meeting, Petroleum Division, A.I.M.E., Ponca City, Okla., September 30.

Fall Meeting of the Petroleum Division of the American Institute of Mining



is led to suspect that whispering campaigns are not confined solely to the realm of politics. Despite the pretense that market demand is a mere gauge of production, we might as well face the fact that equating production to market demand means limiting production so as to bring a reasonable price. There is after all no such thing as demand in vacuum—there is only demand at a price. I do not have to tell you that the "nominations" which at present determine the demand do not generally equal the theoretically maximum physical capacity of the pipe lines and storage facilities. Were the quotas set merely to prevent physical waste, we know that the price might fall even lower than its present ridiculously low level.

We must go before the public with a frank recognition that proration is not a scheme merely to prevent physical waste but that it seeks to deal with the two interlocking problems of physical waste in production and pecuniary losses in marketing, the latter no less vicious than the former. In going before the public we must face the economic problem of marketing as courageously as you have faced the once insuperable scientific problems of production.

Economic Problem of Marketing

What is this economic problem of marketing and how can we face it to secure public support? For more than a century American economic life has feared scarcity. This was a very natural and reasonable fear in an undeveloped country in which there was frequently not enough of many commodities to go round. To take an example with which you are all familiar, "Oil famine" has again and again been a bug-a-boo of your industry. The belief that rapid production was necessary to avoid possible shortage, is even reflected in the decisions which developed the early law of oil and gas. Thus in 1902 we find the West Virginia Supreme Court saying that it favors "a rule of construction which discourages tying up and rendering nonproductive vast fields of mineral wealth," and which "construes every contract and lease as to both, lessor and lessee so as to best promote production, development, and progress and frowns upon every attempt to evade it as being in contravention of both good morals and public policy." (Parish Fork Oil Co. v. Bridgewater Gas Co., 51 W. Va. 583.)

It is a far cry from the "good morals and public policy" of even 1902 to what I am sure most of you would regard as sound policy in 1932. For by the progress of science and American ingenuity, scarcity economics have been replaced by an economics of excess capacity. Your industry like other major industries of this country is suffering from excess capacity. Today we fear not scarcity but surplus. We fear financial chaos arising from an inability to market this huge surplus. In a market based on scarcity competition forced to the market all that it could absorb and the price more or less automatically regulated itself. But now technological advances in your industry, as in others, have so greatly increased the volume of possible production that the market can no longer absorb the surpluses thus created. And, because technological advances have made necessary vast capital expenditures, your industry, like others, has been saddled with huge overhead costs which force producers into distress selling to meet fixed charges. It has become evident that in the economics of excess capacity, uncontrolled competition fails to regulate price and instead compels producers to seek volume rather than profits. Scientific control is as essential to stop the pecuniary losses of marketing crude as it is to check the physical wastes of production. The oil industry has recognized the supreme importance of the crude oil marketing problem. The Oliver program projects a permanent and efficient scheme of proration to limit the maximum amount of oil to be produced. But, we cannot camouflage proration as only a conservation measure. Legislation can and will give proration but the public will consider its implications. The oil industry will not and has not been able to convince the public that proration will not affect the price of gasoline it puts in its cars. The Sharkey Bill in California fell before the cry of 30-cent gasoline and last year's fiasco at Austin resulting in a hopelessly inadequate Texas proration law was due in part to the fear of monopolistic price fixing.

Soft Pedaling Price Talk

You point to the need of education as opposed to propaganda. We cannot hide behind the skirts of conservatism. The estimates of the best experts in the oil industry have again and again declared that we had only a five year or ten-year supply of oil remaining but five years and ten years have come and gone and still we are not without oil. We must cease playing up the horrors of an oil famine just around the corner. The public has heard the cry of "wolf, wolf" too often to believe it, even if this time it should be true. Let us frankly admit that in this great country of ours we shall probably have oil so long as it is necessary for us to have it.

Many of your own technicians have suggested various sources for securing it—they forecast distilling it from shale, recovering it from fields now thought depleted, producing it from cheap coal and lignite. I suspect that neither you nor I nor the public is very much interested in conservation for a vague indefinite future. But the price of oil in the near tomorrow is of vital interest to us all. If we are compelled to effect any very rapid transition to new sources of supply, at what price will this oil be secured?

The question of price has too often been shouted in the council chambers of the industry and soft pedaled before the public. Instead of being a weakness in our bid for public support it is in reality a source of strength. We can show that cheap oil now means disastrous prices for the not distant future. We can show that unreasonably low prices force the premature abandonment of marginal wells long before their time. We can show that unrestrained production of flush fields results in colossal physical waste and that at the present rate of exploitation shallow and inexpensive flush fields are becoming more and more difficult to find. We can show the car owner that cheap oil burned in his furnace today means high priced gasoline for his car tomorrow. If we have the courage to face it our educational program can clearly demonstrate to the public and to the courts that waste and price control are inextricably linked. When this relation is clearly understood we shall have no more of one group arguing that under proration price control is a mere incident to the control of waste and another group insisting that waste is a mere incident to a conspiracy for price control. Such disputes carry us no further than the time-honored debates as to which came first—the chicken or the egg.

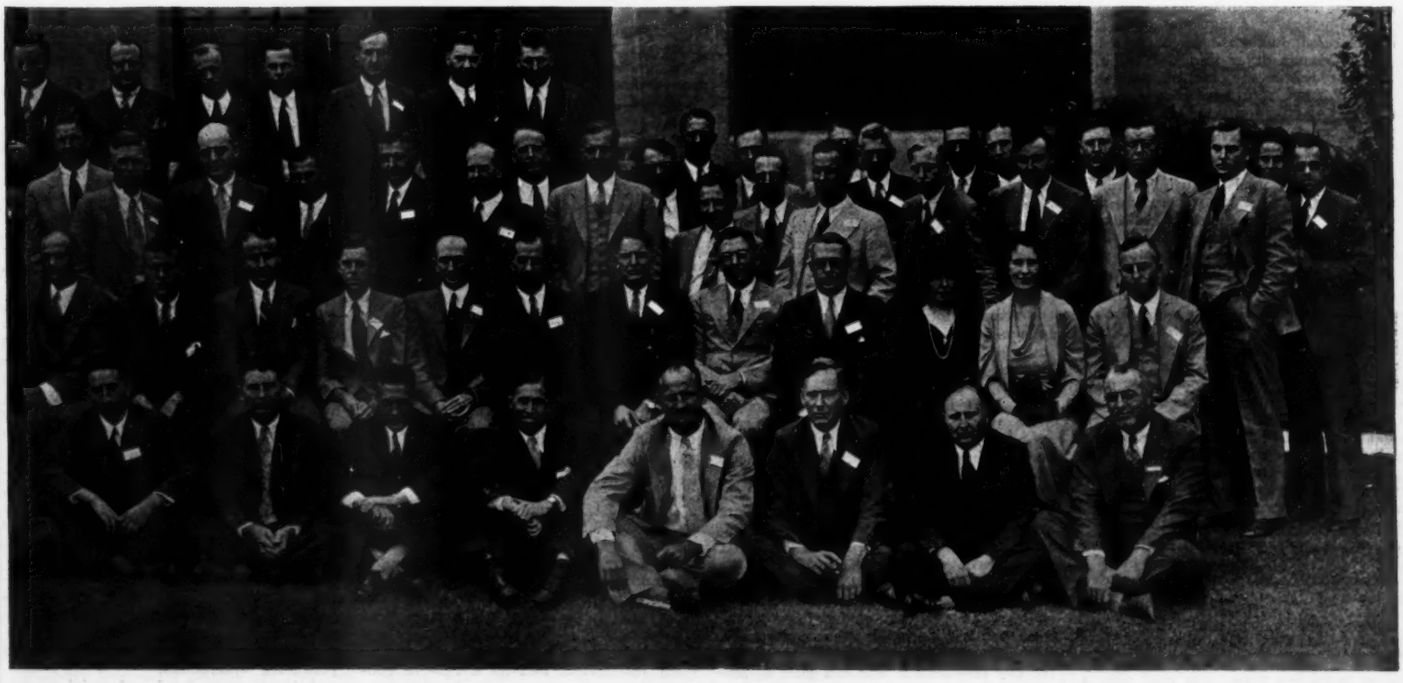
Quite possibly, as Mr. Hardwicke suggested this morning, there may be a valid legal distinction between measures which fix prices and those which merely affect prices. But I think we are making a serious tactical error if we present proration to the general public as dealing only with conservation. The future course of proration will probably demonstrate that it does control prices and fix them at a reasonable level. Indeed, we may go further and say that unless proration does control price, it will not be successful. And unless the industry faces this fact squarely in its presentation to the public, it is likely to become the football of demagogues who may be able to frustrate proration merely by pointing to the recent rise in the price of crude from a few cents to a dollar a barrel. Public opinion educated as to the interlocking character of controlled price and conservation for use is the only insurance against the kind of propaganda which killed the Sharkey Bill.

Law of Supply and Demand

But we must present to the public and the industry a means of control which will be fair both to the many factors within the industry and to the consumer. Convinced of the desirability of control the public will demand to know who are to be the controllers. Control of production must of course be based upon a fair equation of available supply to ascertained demand. But demand can only be ascertained by reference to price. The higher the price, the less the demand. When there exists a surplus of available supply, those who seek to calculate demand must necessarily select the price level which will determine demand. We speak too glibly of the law of supply and demand determining price as if supply and demand and public were susceptible of calculation with mathematical certainty. And although I hesitate to suggest a mathematical analogy to a group which probably knows so much more of mathematics than I, if we must be mathematical about the law of supply and demand determining price, I suggest that no one of these components is constant, but each is a complex variable which varies in terms of the others. The task of those who control is to artificially restrict supply to satisfy the ascertained demand at the selected price. The determination of demand by a system of "nominations," which are said to be a mere statement of existing demand, is necessarily and inevitably a calculation of demand at a price. And if any particular group within the oil industry should set the nominations to which supply will be legally equated, that group will thereby secure control of its own price structure. Such a proposal neither the public nor those groups with-

(Continued on Page 14)

and Metallurgical Engineers at Ponca City, Okla., Sept. 30 and Oct. 1



A Rational Program for the Oil Industry Offered by President W. S. Farish of Humble Co.

By W. S. FARISH
President of Humble Oil & Refining Co.*

For one who is not by training an engineer to suggest to the members of a national society of mining engineers what constitutes a rational program for an enterprise so essentially a problem in mining and engineering as the petroleum industry has become requires greater self-assurance than I possess. Accordingly, I must at once disclaim any thought that what I shall say embodies a finished and complete solution of our problem. I hope only to contribute to such a solution by setting before you some of the observations that years of intimate contact with the oil industry have permitted me to make and by stating some of the personal convictions that have grown out of that long experience.

There is in America a spirit of intense individualism which resents, or at least looks askance at, any attempt to plan or rationalize the operations of competing units in any industry. I am keenly aware of this attitude on the part of many oil producers, and many citizens and officials in oil-producing states, toward a rational program that would embrace the whole oil industry. In spite of this hostility, however, I still feel that it is worth while to study and to attempt to formulate such a program, not only because I believe it would benefit the industry, but because I am convinced that the interest of the public, or commonwealth, in oil, as an essential element in industrial and national security, is so great that the industry will eventually be driven to adopt a rational, comprehensive program, whether or not a majority of those within the industry approve such action. I cannot too strongly stress my feeling that the public interest in our petroleum resources transcends that of the producing industry itself.

A Rational Program

Doctor Leith has already envisioned for the members of this society something of the magnitude of the task which confronts the mineral industry in formulating for itself what he has termed a "national policy."[1] A national policy for the mineral industry as he conceives it demands, among other things, I think, a rational program for the oil industry. We should not fool ourselves with the thought, he tells you, that an adequate program can be planned and put into effect in a short time. On the contrary, the mineral industry "has a long hard course of effort and study" before it. The application of his words to the particular branch of the mineral industry with which we are here mainly concerned; namely, petroleum mining and processing, is remarkably pertinent.

Nevertheless, as Mr. Justice Brandeis announced in his dissenting opinion in the New State Ice Co. case, "If we would guide by the light of reason, we must let our minds be bold." What we are proposing when we attempt to set up a "rational" program for our industry is to guide it by the light of reason. A "rational" program is one "agreeable to reason." We cannot succeed in establishing a rational program unless we have the temerity at least to record and to analyze our studies, our deliberations and our ideas.

It would be extremely difficult to establish convincing evidence of even a modicum of rational planning in the present status of the oil industry. If an inhabitant of Mars (assuming the Martians to be rational creatures) were to visit us he could hardly escape a feeling of bewilderment if not actual dismay at the manner in which we earthbeings carry on this great enterprise, so essential to our convenience and welfare. His first reflection must inevitably be that as a unique source of liquid fuel and of lubricants, in a society totally dependent on mechanized transport and machine-driven industry, petroleum is indispensable not only to the convenience of the individual, but to the actual security of nations and even to the preservation of the prevailing level of culture in humanity at large. He would immediately conclude that here obviously in the winning and preparation of this commodity was an enterprise fraught with importance to the entire commonwealth.

Next, perceiving that petroleum is an exhaustible natural resource, the supplies of which are of uncertain volume, of obscure occurrence, and of doubtful adequacy, he would at once logically assume that comprehensive and perfectly co-ordinated search throughout the earth had been undertaken to the end that the total available reserves might have been discovered, measured as to volume, and made available upon demand; and that once such reserves were established every precaution would have been taken to conserve and safeguard them, and that every economy of operation and every detail of planning would have been introduced and religiously adhered to in order that mankind might for as long a time as possible and at as low a cost as possible enjoy this precious heritage.

Could we demonstrate to him that we have in fact set up proven reserves in adequate volume and that we are reasonably effective and intelligent in conserving our total supply? Surely our hypothetical celestial visitor would be astounded as soon as he came to understand the present situation, wherein vast excesses of supply are poured out on a surfeited market, regardless of legitimate demand for useful consumption, merely because unregulated competition between various units in the enterprise had led to unintelligent over-expansion of facilities. Possibly we could explain, but try as we might we could never justify to our friendly observer this irrational condition.

Present Conditions in the Oil Industry

It is conservatively estimated that $12,000,000,000 are invested in the oil industry in the United States. In value of manufactured products it ranks fifth among American industries. Demand for its products has increased decade by decade at a rate more rapid by far than the demand for other staple commodities in general. Even the recent drastic curtailment of industrial activity has hardly more than touched the demand for oil as compared to other commodities. During a period in which steel production, for example, has declined to 15 per cent of capacity, demand for petroleum has been maintained at more than 92 per cent of the preceding year's consumption.

Looking ahead, however, the American industry would be unwise to anticipate a continued demand for this proportionate volume over the next half year. At the moment we are confronted with the necessity for substantial curtailment of supply. Current demand for gasoline is at least 15 per cent under that of the corresponding period last year. Roughly, the demand for crude is 450,000 bbls. per day less than it was last year at this time. Our imports of crude are under last year's by about 75,000 bbls. daily, while our domestic production is off by 175,000 bbls. daily. Therefore, the situation we face requires that we reduce the current rate of domestic production to the extent of about 200,000 bbls. per day if we are not to add crude oil to our already burdensome stocks.

Among the sources of excessive current crude supply my own State of Texas takes prominent position, I am sorry to admit, with production about 100,000 bbls. per day in excess of demand.

As in the case of crude production, refinery runs should also be reduced. We are entering the winter season of slackened consumption, and at least 200,000 bbls. of oil in excess of our requirements for the winter months are being charged to stills daily.

Evils of Overproduction

I need hardly elaborate before this group upon the evils of overproduction. With unrestrained and unreasoning competition between producers, potential production of crude has been increased in totally unintelligent fashion until actual oversupply temporarily engulfs the industry. We should realize in this connection that the mere threat of overproduction may be almost as effective in disturbing industrial stability as the actual marketing of excess crude. Flush fields, in which the proration or curtailment regulations are not securely and rigidly enforced or are not firmly sustained in the underlying law, may give rise to so much fear and anticipation of a breakdown of control with resultant overproduction that the effect is the same as though the oversupply were actually being produced.

With excess crude seeking an outlet, or threatening to break out of control, refinery operations are stimulated to excessive proportions. Gasoline from superfluous crude supply, once manufactured, must be sold, and accordingly new and superfluous marketing facilities are established. Most of you are already familiar with the extent to which these excesses have been carried. I shall not enlarge upon the subject. Economic waste is involved, as you also well know, in each of these operations. Such waste must result finally in increased prices to the ultimate consumer, over and above what would have been a fair price with efficient and planned operation. Bad marketing practices, rebates and excessive margins at retail outlets are each a part of the chain of evils which inevitably attaches to excessive supply. Actual physical waste likewise attends the activities of the industry as long as it operates under the stress of oversupply. Particularly is physical waste attendant upon producing operations when production exceeds demand, and out of excessive production of crude, over-expansion in all other lines inevitably follows. It is, therefore, the overproduction of crude oil, actual or threatened, that primarily demands remedy, if we are to set up a rational program.

Most Potent Factor

The most potent factor in causing overproduction is rooted deeply in our customs and laws. The original conception of the nature of oil and gas underground was that they were fugitive or migratory entities like wild game, and were, therefore, subject to capture, and should belong to him by whom they are first reduced to possession. Out of this early conception, and as a rule of convenience incident to practical difficulties of identification and operation, there has grown up in law the dictum that whoever drills a well on his property is entitled to recover from it all the oil and gas that can be obtained from it, even though its output comes wholly from beneath the adjacent lands of his neighbor. Since oil and gas in natural reservoirs are subjected to high pressure they move toward any point where pressure is relieved, such as the foot of any oil well that penetrates the reservoir. Under these conditions it is possible for a well on A's land to drain oil from B's land. Legally, aside from the exercise of the police power, B can only protect himself from loss of this character by drilling an "offset" well for himself. This is not an adequate remedy. Drilling an offset well does not protect B under all circumstances against the loss of part of the mineral wealth which originally underlay his land, and which under the basic laws governing property rights he owns and is entitled to enjoy. However laudible their intent, our laws and customs in this connection result in what is virtually "legalized piracy"—the grant of a legal right to take and thereafter own and enjoy that which under fundamental principles of law is the property of another. This puts a premium on greed, and tends to launch every oil producer on a piratical expedition to capture and possess his neighbor's oil.

Reservoir Pressure

As a result of this legal dictum it becomes impossible for one operator to keep his oil in the ground if his neighbor chooses to produce from adjacent wells, or even for 100 operators in a pool to keep their oil in the ground if a single operator in the same pool chooses to produce his oil. If anyone fails to produce, and to produce at the same rate as another operator in the same pool, then the first producer loses part of his oil and gas. Moreover, since oil and gas are brought to the surface in large measure through the agency of the reservoir pressure which is common to all parts of the reservoir and which may be rapidly dissipated through the release of pressure at any point, the producer who fails to take out his oil at the same time and at the same rate as his neighbor soon finds the reservoir pressure, part of which he was entitled to use in producing his oil, entirely gone. The gas which normally is dissolved in the oil in the reservoir has escaped, leaving the remaining gas-free oil dead and viscous in the pores of the reservoir, to be recovered, if at all, not by natural flow but by pumping or other artificial and relatively expensive means.

The whole effect of this legal conception of the rights of oil and gas producers is to drive every producer to drill and develop his property and produce his oil. He would rather store it on top of the ground, subject to waste in part, or even destruction by fire, than to leave it in the ground for his neighbor to appropriate under protection of the law.

In the face of the established practice in American oil-producing operations, the task of modernizing and making truly efficient the exploitation of our oil fields—the task of setting up a rational program for the oil industry—takes on staggering proportions. Outside our own country the problem is infinitely simpler because of different fundamental legal conceptions and also to a less deeply ingrained spirit of individualism in foreign producing enterprises.

Aside from its legal and social aspects

*Before Petroleum Division, A.I.M.E., fall session, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

[1]Leith, C. K., What Is the Policy of the Mineral Industry? Trans. Am. Inst. Min. & Met. Engrs. (1932), pp. 13-17.

our American problem will require much engineering talent for its solution. You gentlemen have that responsibility. We have attempted to set up measures for control in the important producing states. You know as well as I how lamely these agencies function. California, perhaps, is in more fortunate position at the moment than Texas and Oklahoma are, but in each state there is a crying need for improvement in method. Consider the spectacle at Oklahoma City and in East Texas, in each of which pools hundreds of unnecessary wells have been drilled (at the ultimate expense of society at large) and millions of barrels of oil have been illegally produced as a direct result of inadequate means of enforcing effective conservation laws. Until we can perfect our machinery of production control we cannot adopt a rational program for the oil industry because control of production is itself the keystone about which the structure must be built.

Essentials of a Rational Program

In the first place, from what point of view shall we judge of the rationality of our proposed program? Certainly it should appear rational, i.e., reasonable, to the various branches of the industry itself; to the producer, the transporter, the manufacturer and the marketer. But it should also appeal as reasonable to both the large and the small units in the various fields of operation; the large integrated unit, which is engaged in producing, transporting, refining and marketing alike, cannot reasonably hope to set up a program which would eliminate or discriminate against the legitimate small operator or individual operator in either of these several fields. Our program must be rational as between these elements within the industry itself. But equally important is the necessity that our program shall appear reasonable also to the public which I conceive to have a compelling interest in a continued adequate supply of liquid fuels and lubricants at reasonable prices.

Public attitude will ultimately reflect itself in government action, from which fact we are driven to a consideration of government's point of view. No program which is unreasonable from any of these points of view can truthfully be described as a rational program. Finally, if our proposed program is to serve a good purpose, it must take some account of the future. It must be rational tomorrow as well as today. It cannot deal with the current situation without at the same time taking into account what our later needs may be.

Fundamental Characteristic

The fundamental characteristic of a rational program for the oil industry, under the conditions which prevail today, may be stated in a single short sentence: It is so to control production currently that it does not exceed current consumption; it is to balance supply with demand. Propertly to balance supply with demand, however, involves consideration of a number of factors, each of which may take on a complicated aspect. But effectively to balance supply with demand accomplishes so many things that are desirable from each of these points of view that it becomes in reality the essence of a rational program. It tends to prevent physical waste, desirable from all points of view. In fact without a balance between supply and demand physical waste cannot be entirely eliminated from oil production. As long as the production from any oil pool with divided ownership exceeds the total demand for oil from that pool disproportionate withdrawals from different properties may result and, in any event, some oil must go to storage in tanks aboveground. Both of these results are attended with physical waste.

To balance supply with demand permits and expedites the establishment and maintenance of adequate petroleum reserves underground ready to be drawn upon at will. Failure to balance production in pools where divided ownership obtains with the demand for oil from that pool destroys the reserve therein to an important degree. And as President Coolidge long since pointed out, the public interest demands that adequate underground reserves of petroleum be discovered, proved, and developed for use in any emergency that may arise.

Haste and Waste

A balanced supply-demand relationship lowers the cost of producing oil and of supplying its products to the consumer. No greater factor in increasing costs can readily be conceived than the recurrent feasts and famines that follow each other in the ordinary competitive development of a series of oil fields. Haste and waste attend the feast which results from the frenzied development of each new pool to its maximum capacity at the greatest possible speed. Pipe lines are built to carry the peak production of oil fields which all too soon are depleted to a point where only a trickle of oil can be pumped from them through the overbuilt lines. Refineries spring up at sites remote from consuming centers to process crudes from flush fields, only to rust prematurely away when the temporary oversupply vanishes. Haste and waste again attend the ensuing period of famine or undersupply when frantic, ill-planned exploration perforates the face of the earth with thousands of unnecessary dry holes. These are potent factors in increasing costs above the level that would prevail if, by the orderly exploration and development of oil pools, a balance between supply and demand were maintained.

There are many other problems in the transporting, manufacturing and distributing branches of the industry, such as pipe line rates, refining practice, spreads to retailers, etc., the solution of which is not so directly tied to the control of crude production as those just mentioned. These problems will require attention when the details of a rational program for the oil industry are finally completed. They are important, but in this discussion I shall omit them as well as similar collateral problems in the producing branch.

Bad Economics

To balance supply with demand requires an intelligent understanding of the markets and the producing areas throughout the world. To move oil from one producing area to a remote market through the heart of another producing area competent to meet the demand at a lower total cost is bad economics. Yet we frequently encounter such movement of oil products in the world's commerce today.

When potential supply in excess of demand is not restrained the industry is driven to seek additional outlet for its excess production. This influence spurs us to seek new uses for oil, and under its stimulus the industry has carried out research and investigation that have greatly expanded the market for petroleum products with resultant benefit to society at large. But the same excess production forces large volumes of oil and its products into uneconomic and inferior uses such as competition with coal, or other cheaper or more available fuels. Clearly the latter tendency is contrary to public interest. A rational program for the oil industry requires at once a balance of supply and demand to prevent the inferior use of oil, and the maintenance of an organized research enterprise to extend the use of oil to all the purposes which it is best suited to serve.

Price Question

No program for balancing supply with demand can make any pretense of being rational if it, in fact, permits curtailment of supply for the purpose of raising prices of products to the public. At the risk of digressing from my subject, I want to emphasize this point. Proration is not properly a device to secure higher prices, as so many producers appear to believe. Curtailment of supply is justifiable only to the extent that it is necessary to prevent waste of oil or of equipment or of effort. Prices should be absolutely free to find their natural level purely on a supply and demand relationship, supply being curtailed only as is necessary to prevent physical waste, to secure low costs, to save unnecessary capital expenditure and to avoid the overexpansion of facilities.

As a matter of fact, a rational program for the oil industry, like a rational program for the mineral industry at large, as outlined by Doctor Leith in the paper previously referred to, is essentially a conservation program and it is probably neither necessary nor even desirable to go beyond the limits of effective conservation of the mineral resource itself, and of capital funds available for industrial purposes, to arrive at a satisfactory program for the oil industry.

Yet it is clearly not in the public interest, and it is probably not in the interest of the oil industry as a whole, to permit oil from a flush, low-cost field to be developed and marketed in such volume and at such low prices as to enable it to capture and monopolize distant markets, outside the consuming territory naturally tributary to it. A prolific, low-cost field of this character might temporarily supplant, as a source of supply, a number of old, partly depleted, and consequently high-cost fields, which would thereupon be abandoned, temporarily or permanently, with the resultant loss of a part or all of these high-cost reserves. If the Gulf Coast region in Texas, for example, could produce oil and transport it to Michigan so cheaply as to capture that entire market and cause the abandonment of the oil fields situated in Michigan, and the drowning out or loss of the reserves in those fields, the interest of the public at large would have suffered. Production should be under such control as would prevent such excesses.

Fear of Regulation

I consider the limitation of production to market demand to be essential for the prevention of physical waste, particularly in pools where producing properties are held in diverse ownerships. Much of the opposition now being voiced to any regulation which would limit production to market demand to the degree necessary for the prevention of physical waste arises from the fear that such a regulation would carry with it a further regulation of maximum prices to the public for petroleum products. I do not concede that such a regulation as a part of the conservation measures of oil-producing states would necessarily involve, as a corollary, the fixing of maximum prices for petroleum products. On the other hand, whenever it became evident that prices had been raised so high as to be unfair to the public, I am convinced the Government would attempt to regulate prices, whether production were at that time curtailed or unrestrained. In other words, if for any cause there develops a scarcity of supply of petroleum products, the Government will do its utmost to insure fair prices to the public. Continued wasteful methods within the industry and the lack of any control over production might give rise to a situation in which price fixing would be attempted sooner than any necessity for such action would arise through intelligent curtailment of supply to demand as a part of a rational program.

Engineering Principles

A rational program for the oil industry demands the application of sound engineering principles to the exploration and exploitation of oil pools. This group already knows better than I do what is involved in sound petroleum engineering. However, I know that we must attain the fullest possible utilization of the natural forces which tend to expel oil through wells from the underground reservoirs in which we find it. Effective conservation undoubtedly requires slow orderly withdrawals from different parts of the reservoir. I believe that efficient exploration and economy in producing practice demand that the initial spacing of wells in an oil pool be relatively wider than will ultimately be resorted to. In current practice we drill far too many oil wells. With sound engineering in our producing effort we can eliminate, as useless, at least 50 per cent of the drilling we have done in the past. Certainly development and lifting costs can be greatly reduced and ultimate recovery vastly augmented if we operate in the light of good engineering practice as opposed to old or even current average practice. Adoption of these principles at once precludes the gluts of flush production that have so often attended the development of new fields in the past. Good engineering practice permits us to maintain our underground reserves, but for this purpose such practice demands the operation of each separate oil pool as a unit. In the final analysis the maximum benefits of sound engineering practice can be obtained only by unit operation.

Unfair Allowables

At the moment we particularly need the assistance of engineers in our attempts to establish ratable withdrawals from different properties in a common pool. To calculate allowable withdrawals in proportion to total potential as in Oklahoma City, or on a flat well basis as in East Texas, defeats our efforts to produce oil efficiently. These distorted and unfair allowable figures cause physical waste, violate the correlative rights of property owners, and force the drilling of thousands of useless wells; they are intolerable. I believe that engineers can devise a rational formula for the determination of allowables from various properties in any pool where outlet must be prorated. This service would assist greatly the effort to formulate our rational program.

No program which fails to provide adequately for the correlative rights of different owners of the surface above a common pool of oil can make valid claim to being rational. Each owner must be protected in the fullest enjoyment and use of his property that is commensurate with the enjoyment of similar rights and privileges by other neighboring owners. We must educate ourselves as well as the public in the matter of what such rights and privileges involve. It is partly for you engineers to determine where equity lies. Is a man entitled to all the oil and gas he can recover from a well drilled on his land, regardless of where it comes from in the reservoir beneath his and his neighbor's land? I presume we all agree that only a pirate would any longer contend for this interpretation of a lease owner's rights. Is a man entitled only to the recoverable oil and gas which was originally present beneath his land? Or is he entitled to that proportion of the total recoverable oil and gas content of the reservoir? Or is he entitled only to be compensated fairly for the one or the other in lieu of the actual commodity in each case? Any of these last-mentioned proposals sounds more equitable to an engineer, I am sure, than does the old piratical conception of an oil lease owner's rights. But as between these proposals, choice is debatable. Some of our engineers contend with convincing logic that neither of the foregoing proposals is capable of practical accomplishment and that what a given landowner should be guaranteed under the modern conception of good producing practice is not the recoverable oil and gas originally in place beneath his land, nor the value thereof, but that proportion of the original recoverable contents of the pool (or the value thereof) which he would be able to produce from his particular tract under a program of uniform and efficient producing practice for the pool as a unit.

Correlative Rights

However you, as engineers, may feel about these suggestions, they are a part of the problem of correlative rights among common owners of an oil pool. Facts and controlling principles must be enunciated by engineers before this problem can be solved and before any rational program for the oil industry can be set up.

The most important aspect of a rational program for the oil industry, however, is the recognition of public interest. I have already emphasized the right of the public to require of the industry that it shall attain the lowest possible costs in order that correspondingly low prices to the public may be maintained, and to demand of the industry that it find and prove and maintain adequate

reserves for national needs, and that to this end it eliminate waste.

We have recently had impressed on us still another demand which the public clearly considers itself entitled to make of the petroleum industry as well as other industries; that is, that we shall conduct our operations and plan our work with sufficient intelligence to maintain stable, orderly and uniform employment for both capital and labor. In the future we will not long be permitted with impunity to throw vast resources in men and money into unwise or nonessential or superfluous activity; nor, conversely, to throw these same resources in men and money suddenly and peremptorily out of employment entirely. Our rational program must entail security of job both for the dollar and for the man.

Finally, as has already been indicated in the discussion of control of production rates, a program for the oil industry to be rational must recognize and provide for the public interest that demands consideration for different producing areas in a producing region to the end that petroleum reserves may not be lost to society through the relatively high costs that result from partial depletion, through remoteness from consuming centers, through the character of the raw product, or through any other cause. Such reserves must be preserved as long as there is any possibility that they may in the future be needed.

Accomplishment of a Rational Program

To accomplish the things which a rational program for the oil industry calls for demands of us a great deal that is not immediately attainable. Most important is the need for further education both within and outside the industry as to the facts and principles that are involved in a rational plan. The attitude of the industry itself in large part stands directly in the path along which we must travel. A particularly formidable obstacle is the feeling on the part of an occasional small producer of crude oil that the employment of sound engineering principles in production practice would work to the undue advantage of the large producer and would in the end efface the little fellow entirely from the oil-producing picture.

It is argued that the small producer can have no part in the unit operation of oil pools because such operation usually requires capital and equipment resources beyond his reach. But unit operation of pools is admittedly part and parcel of efficient producing practice and of any rational program. Therefore, it is contended the small operator is eliminated. I am convinced that this is an erroneous impression and that a rational program would in fact make for the greater security of the legitimate small producer as a profit-sharing partner in the oil-producing industry. Unit operation is often a large operation, it is true, but it can practically and readily be made a joint operation between large and small ownerships of undivided interests. The small operator can pool his interest and have a voice in the joint management. He gains the advantage of lower costs, greater ultimate recovery, better average prices, greater permanency and security of investment. Once the industry is stabilized on the basis of this class of operation, the small owner in a unitized pool has an investment that for safety, yield, and convenience could hardly be duplicated in any other field. In return he would have sacrificed only the personal conduct of his own business apart from anyone else, and the piratical right to appropriate his neighbor's oil, if possible, through wells drilled on his particular tract. The small producer must be educated as to the facts in the case.

Need for Education

Our conservation authorities likewise require enlightenment. Until they and our other state officials and our law makers comprehend more of the facts and more fully understand the principles involved, and realize the imperative need for integrity in their application, we can make but little progress. The public, consumer, banker, lawyer, civic leader; and informed and understanding point of view on the part of all these with respect to the oil industry and its problems is essential and prerequisite to the establishment of our program.

This work of education derives great impetus and advantage from enterprises of the character of this meeting. Your activities here are in fact and literally pioneer efforts in the educational movement which must precede the accomplishment of a rational program for the petroleum industry. Because of his outstanding activity in this pioneer work, your chairman, Earl Oliver, deserves much credit.

Once the necessary education has been effected our antitrust laws must be modified to permit of voluntary agreements among producers for the control of production in the individual pool and, in times of general overproduction, in larger areas as well. Such agreements obviously much be approved by and have the sanction of proper government authorities, in order that the public interest shall at all times be adequately protected. No difficulty attaches to carrying out this modification and at the same time protecting the public interest, other than the opposition which I have attributed principally to the generally prevalent imperfect comprehension of the facts and principles involved in a rational program.

Laws Required

The enforcement of a rational program for the oil industry, once the barriers above described have been removed, is, to my mind, almost entirely a function of the police power of the several producing states, with possibly some measure of co-ordination from Federal authorities. Adequate laws must be enacted by oil-producing states, requiring the performance of those things which science and engineering have found to be essential to conservation, to efficient oil production, and to the protection of the correlative rights of the common owners of an oil pool; and investing duly constituted conservation authorities in each state with power to enforce the provisions of such laws. I have reviewed the general form such conservation laws should take in another place[2]. The whole arrangement contemplates, in addition to the separate action by each state along the lines above indicated, co-operative action between producing states either through a joint committee or interstate compacts, by virtue of which the conservation authorities in each state may inform themselves as to the volume of oil required to meet the reasonable demand from time to time, and thereby be enabled intelligently to fix the appropriate participation of their respective states in the anticipated market outlet.

Conclusion

In conclusion, a rational program for the oil industry involves principally the maintenance during periods of temporary oversupply of the balance of supply and demand to the end that physical and economic waste shall be eliminated. There are, of course, vexing problems in other branches of the industry such as refining and marketing, but these can be largely solved if the supply of crude is reasonably balanced with demand. A rational program is almost identical with a conservation program. Each one requires that sound engineering principles and practices be utilized to the fullest possible extent in the production of oil. More important, each one requires that the paramount interest of the public in our petroleum reserves be recognized and deferred to by the industry, and protected in law.

[2]Farish, W. S. Problems of Preventing Waste of Oil and Gas and Stabilizing the Petroleum Industry. The Oil and Gas Journal (June 30, 1932, issue, pp. 10-12).

ENGLAND'S OIL IMPORTS RISE

NEW YORK, Oct. 4.—Imports of crude and refined petroleum into the United Kingdom during August aggregated 219,683,772 gallons, as compared with 202,879,321 gallons in August last year.

DeGolyer Resigns

E. DE GOLYER

E. DeGolyer, chairman of the board of the Amerada Petroleum Corp. and of the Geophysical Research Corp., has resigned these positions, effective November 1. It is understood Mr. DeGolyer will devote most of his time to engineering and geological consultation work.

Lawyer Advocates More Frankness in Discussions

(Continued from Page 11)

leaders of the industry have recognized that the determination of demand must be vested in some impartial agency. And, an impartial agency does not mean that state commissions should be merely clearing houses which will adopt the monthly nominations fixed by a certain group within the industry. Nor do I see how redefining market demand to mean "current consumption and use" disposes with the need of an impartial agency of control. A truly impartial agency must, through independent surveys, balance the public's interest in low-priced gasoline with the industry's interest in high priced crude; it must reconcile similar conflicts within the industry between large and small refiners, producers and landowners.

And it must be remembered that the public interest involves not only the inhabitants of the eight great producing states, but the inhabitants of the 48 states as well. This means that the impartial agency must represent national as well as sectional interests—consumer as well as producer. Only such an agency can strike a fair balance between intensely conflicting interests both within and without the industry; only such an agency can effectuate a successful program of planned production. We all have seen the futility of proration in Oklahoma City when East Texas was allowed to run wild. No permanent solution of this problem has been found in the loose informal agreements of state commissions and martial law governors. Interstate compacts have been proposed. But interstate compacts require the approval of Congress. The approval of Congress can only be got if our program safeguards national as well as local interests. It must assure at least a fair price to producer and no more than a reasonable cost to consumer. So even though the U. S. Supreme Court recently declared in the Champlin case that proration is not a burden on interstate commerce, it does not follow that proration can be pursued as a purely local matter. Our only chance of success is to create a national sentiment in favor of a program of stabilization.

Stabilization on a national scale is the hope of the oil industry. It is no longer necessary to hush hush the matter of price control. The demoralization which follows in the wake of huge surpluses and low prices is everywhere apparent. We have too much wheat, too much cotton, too many steel mills, too many coal mines. Yet much of the discussion here today has proceeded on the assumption that the problem of surplus is peculiar to the oil industry. The law is blamed. No doubt the law does aggravate the problem by forcing hasty exploitation when new pools were discovered. But the frantic race of speculators to discover new pools, heedless of market conditions, has not been the fault of the law. This is a fault line which runs through our entire economic structure.

Even during this recent era of disastrously low prices of crude, the pages of The Oil and Gas Journal tell the story of many new wells being drilled in unproven areas; of a constant stream of new recruits trying to enter the oil business in the face of a present excess capacity. Too many ignorant and marginal producers is not peculiar to the oil industry—the same is true of many of our industries. I know that some of you say that if we seek to control this situation by control of supply, demand and price, we shall kill initiative and efficiency. As for certain kinds of initiative there might be applied a harsher but more accurate term—gambling. This kind of initiative we can afford to dispense with for although it may make the individual rich, it may wreck an industry if an uncontrolled East Texas is found. Furthermore, it seems to me that in the long run efficiency and intelligent initiative are more likely to be promoted rather than retarded if some impartial agency defines a plane of competition below which prices shall not fall, and perhaps at some future date, above which prices shall not rise.

Control of Markets

The oil industry in its short but spectacular career has displayed remarkable ingenuity in solving its technical and scientific problems. It must now have the courage to plan its economic destiny with the same scientific spirit with which it has met its engineering problems. Let us not delude either ourselves or the public that we are seeking only to conserve our oil. We are doing more, we are seeking to control our markets. We are doing it because our markets and our production are inextricably linked.

When we speak of an impartial agency of control, many think of political control. But government is a broad term and there are many kinds of government. Our main task is clearly the development of an impartial agency of government—controlled and directed by the best intelligence of the industry but which carries assurance the "power held in trust for public" shall be something more than an empty phrase. Unless we can work out such a scheme, we are likely to have political government and soldiers or policemen in our oil fields whether we want them or not. And if the oil industry can succeed in meeting the economic problem of surplus production, it may achieve something of far greater importance than even the conservation of our irreplaceable resources, important as that may be. It has it in its power to point the way to a new era for American business. The future of American business, as I see it, depends on its ability to work out some system of control which will combine the undoubted benefits of a certain amount of competition with the advantages of collectivism about which Doctor Leith spoke this morning. The oil industry has an opportunity to demonstrate a practical way to substitute for the imperfect guidance of the inefficient hidden hand of competition, the intelligent and conscious control of planned production.

HUMBLE HEARING OCTOBER 31

SAN ANTONIO, Tex., Oct. 3.—Humble Oil & Refining Co.'s application for a permanent injunction against Attorney General Allred to restrain him from enforcing the provisions of the ratable taking pipe line law in East Texas came before the Federal court here and the temporary injunction was continued in force until October 31.

Whether you are a Dubbs licensee or not—

We want you to know that we have solved your gum problem The credit goes to Universal's research men; the benefits go to you if you want them

The remedy is an effective liquid inhibitor

Add one gallon (or less) of it to 100 barrels of your gasoline and you can forget all about gum

This is now a fact—proved by treating millions of barrels of various cracked gasolines

Dubbs licensees can get this inhibitor at a preferred low price—one more advantage of being a Dubbs licensee But the price to other refiners is low enough to give a substantial saving over other methods

Would you like to prove this inhibitor in your own gasoline? Then write us

The sooner you do, the sooner your gum troubles are over

UNIVERSAL OIL PRODUCTS COMPANY

By H. J. Hall
President

Universal Oil Products Co
Chicago Illinois

Dubbs Cracking Process
Owner and Licensor

Approve Antiknock Gasoline Testing Method Correlating Laboratory and Road Data

Satisfactory correlation between the knock intensities of fuels rated in cars on the road and the octane-number ratings of fuels as determined on the C.F.R. engine is the outcome of an intensive period of co-operative road and laboratory test work conducted under the direction of the road-test correlating group of the C.F.R. detonation subcommittee. This correlation has been made possible by the development of a method for making road knock ratings and by minor modifications in the C.F.R. apparatus and procedure, both of which received the approval of the co-operative fuel-research steering committee at its meeting in New York September 16. The modified knock-testing procedure was officially designated as the C.F.R. motor method, with an order to retain the old method for experimental purposes under the title C.F.R. research method.

Cars and Fuels Tested

Fifteen cars, including the popular makes and models now on the road, were tested on Uniontown Hill, Pa. These were the Buick 32-67; Ford Model A; Ford V-8; Chrysler 8, 1932; Hudson 1932; Nash 1932; Oldsmobile 1932; Plymouth 1932; Studebaker President 1932; Dodge 6, 1932; Chevrolet 1932; Chevrolet 1932, high compression; Buick 1931; Chrysler 1931, high compression, and Studebaker 1930, high compression.

Fifteen fuels selected as representative of the entire range of commercial gasolines were used in the tests. The fuel samples were labeled with a system of letters and numbers, the key to which was known only to the secretary of the committee and which has since been destroyed to avoid any possible identification of commercial gasolines. The fuels included were a liquid-phase cracked gasoline, a vapor-phase cracked gasoline, a blend of 65 per cent of the above liquid-phase cracked gasoline and 35 per cent of the Reference Fuel A, a blend of 50 per cent of the above vapor-phase cracked gasoline and 50 per cent of the Reference Fuel A, and a group of commercial fuels known as the UT Series, which included Gulf, Tydol, Sunoco, Texaco, Atlantic White Flash, U. S. Motor, Amoco, Atlantic-Ethyl, Penreco-Ethyl, a cracked California and a straightrun California gasoline.

The road tests continued from August 3 through August 17. All results obtained represent the findings of at least two groups of men, sometimes of three or four groups, usually three men to a group. More than 2,500 runs were made up the hill, and approximately 10,000 observations of knock were recorded. No individual laboratory has available enough trained experts to approach this quantity of work, even over a long period of time. Co-operative effort alone is responsible for the mass of data collected.

These data were carefully analyzed, tabulated and plotted. The graphs indicated knock intensities, knock ratings over the entire knocking range and maximum knock ratings. These data, boiled down into one chart, showed the maximum spread in ratings obtained on each fuel for each car and the average of maximum knock ratings for each fuel in each car.

Maximum Knock Ratings

A study of these charts revealed three important findings:

1. The spread of knock ratings, with the exception of three cars, was about 20 per cent of Reference Fuel C, or about 5 octane numbers for commercial fuels. For the straight cracked fuels, the spread was much greater. It should be understood, however, that the spread as plotted did not mean variation between groups but an actual spread in ratings observed under different methods of test.

2. For the commercial fuels, the maximum knock ratings usually fall within the total spread.

3. The knock intensity ratings, made in each case at the speed of maximum knock for each of the commercial fuels, fall within a comparatively narrow range representing a maximum spread of about 5 octane numbers. For the straight cracked fuels the alignment is not so good, but the total spread is also greater. The getting of a representative road rating for these straight cracked fuels appears to be a matter of the very roughest approximation because of the wide divergence between cars.

The average of the maximum knock ratings for all cars on each fuel was agreed upon as the most satisfactory road rating for the fuels tested that the operating group was able to determine.

TABLE 1—SUMMARY OF RATINGS ON FUELS TESTED AT UNIONTOWN*

Fuel	C.F.R. Research Method: Reference Fuel C in Reference Fuel A, per cent	C.F.R. Research Method: Equivalent octane number	Road ratings: Reference Fuel C in Reference Fuel A, per cent	Road ratings: Equivalent octane number	C.F.R. Motor Method: Reference Fuel C in Reference Fuel A, per cent	C.F.R. Motor Method: Equivalent octane number
RT- 9	95	75	77	70	74	70
RT-10	111	79	75	70	74	70
RT-11	66	68	54	64	55	64
RT-12	68	68	49	63	50	63
UT- 1	82	72	63	67	62	66
UT- 2	1	50	4	50	4	50
UT- 3	56	65	53	64	54	64
UT- 4	61	66	55	64	55	64
UT- 5	75	70	63	66	64	66
UT- 6	110	79	100	77	103	77
UT- 7	69	68	56	65	58	65
UT- 8	82	72	70	69	70	69
UT- 9	76	70	67	68	68	68
UT-10	103	77	94	75	88	73
UT-11	111	79	102	77	90	74

*The values are based on very limited calibration made at Waukesha and while accurate within commercial limits are subject to further check.

Road-Test Procedure Developed

On the basis of these data, the following road-test procedure was approved and adopted by the detonation subcommittee and later by the co-operative fuel-research steering committee:

Road knock ratings on motor gasolines shall be made by a method involving a comparison between the sample to be rated and a reference fuel; this comparison to be made between the points of maximum knock of each fuel without regard to whether this point of maximum knock occurs at the same time or different speeds for the sample and the reference fuel.

More specifically, in rating a fuel in a car by this method it is necessary to determine:

1. The relative knock intensities produced by the sample at different speeds during either slow acceleration or slow deceleration.

2. The relative knock intensities produced by the reference fuels at different speeds during a similar period of slow acceleration or deceleration. From these data the speed required to produce the maximum knock intensity for each fuel, that is, the sample and the reference fuel, is determined.

3. Finally, the knock intensity produced by the sample at its speed for maximum knock is to be bracketed between knock intensities produced by two reference fuels at their maximum knock speed.

The rating is then expressed in terms of a reference fuel which will produce a maximum intensity that matches the maximum knock intensity produced by the sample to be rated.

In making ratings by this method, it is to be understood that they are to be made at full throttle and within a speed range of 15 to 50 m.p.h.

Figure 1—Operating group at Waukesha Motor Co.'s laboratory showing the modified C.F.R. engine. Group at left: Back row—J. M. Campbell, General Motors Corp.; S. P. Marley, Vacuum Oil Co.; W. G. Ainsley, Sinclair Refining Co.; W. M. Holaday, Standard Oil Co. (Indiana); H. W. Best, Yale University. Front row—A. W. Pope, Waukesha Motor Co.; J. B. Fisher, Waukesha Motor Co.; J. E. DeLong, Waukesha Motor Co.; K. T. Winslow, Waukesha Motor Co.; J. R. Sabina, the Atlantic Refining Co. Group at right: Back row—K. S. Hollister, The Texas Company; H. K. Cummings, U. S. Bureau of Standards; F. C. Schulze, Waukesha Motor Co.; E. R. Rutenber, Waukesha Motor Co. Front row—N. R. White, U. S. Bureau of Standards; C. B. Veal (seated), Society of Automotive Engineers, Inc.; L. A. Hunt, Ethyl Gasoline Corp.; G. A. Hope, Standard Oil Co. of New York; G. C. Rodgers, U. S. Bureau of Standards

The modification of the C.F.R. knock-testing apparatus and procedure to correlate laboratory results with the results obtained by the newly established road-test method was unanimously determined upon as the next step in the undertaking.

H. L. Horning, president of the Waukesha Motor Co. and an active member of the detonation subcommittee since its inception, generously offered complete facilities for conducting co-operative tests at the laboratory of his company. Accordingly, the second phase of the test program was started at Waukesha on August 24, and by dint of the most concentrated efforts, operations being planned on a basis of two shifts per day, the operating group assigned to this problem brought its work to a satisfactory conclusion in time to render a report at the September 12 meeting of the co-operative fuel-research steering committee.

The correlation work at Waukesha was conducted with identically the same fuels that were used in the road tests at Uniontown, the remainder of the supply of fuels having been carefully transported by truck from Uniontown to Waukesha.

Changes in C.F.R. Apparatus

At the outset of the work, two changes in the standard C.F.R. engine were adopted, as follows:

1. A shrouded intake valve designed to give the charge a swirling motion as it enters the intake port.

2. An improved type of steam condenser and the elimination of the circulating pump.

These two changes proved effective throughout the work and, on the recommendation of the operating group, were formally adopted by the detonation subcommittee and later approved by the steering committee. The engine in its changed form is shown in Figure 1.

The first task before the laboratory operating group was to determine what degree of correlation existed between ratings made by the existing C.F.R. knock-testing procedure and the Uniontown road ratings. This correlation is shown in Figure 2, in which the Uniontown ratings are plotted on the vertical axis against the C.F.R. ratings on the horizontal axis. Exact correlation between road ratings and laboratory ratings would be shown by points falling on the 45-degree line midway between the two axes.

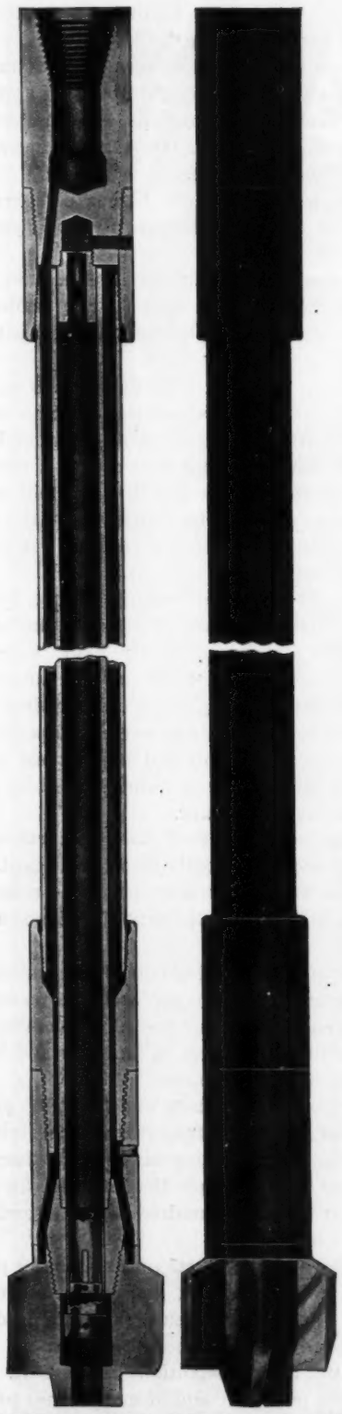
This chart shows a decided lack of perfect correlation and indicates that the average discrepancy between the C.F.R. engine ratings by the existing procedure and the road ratings was of the order of magnitude of 10 per cent of Reference Fuel C-6 in Reference Fuel A-2, or the equivalent of about 2.5 to 3.0 octane numbers for commercial fuels. In certain cases the discrepancy was greater.

Since these data established the fact that ratings made by the C.F.R. knock-testing procedure do not correlate with the road results, the problem resolved itself into one of modifying the existing C.F.R. procedure in such a way that more nearly perfect correlation could be obtained between the laboratory test and the road test. In making the necessary modifications, the committee aimed to obtain the best correlation possible by the most practical means; that is, means which would involve the minimum amount of change in the existing equipment. An effort was made to reproduce normal automotive-operating conditions in so far as possible and to develop a method that would lend itself most readily to routine practice and by which knock ratings could be made on fuels varying in antiknock quality over a wide range.

With these principles in mind, certain engine operating variables, which several

(Continued on Page 60)

A full Recovery *from every* Operation



AUTOMATIC CORE BARREL
PAT. NO. 1,505,346

Barrel equipped with Roller Bit

A full recovery and a clean unbroken core is assured in any formation if the new Brewster Automatic Core Barrel is used. The use of this late development in core barrel will decrease your production costs through increasing the efficiency of the operation.

The automatic features of this Core Barrel are: 1. A clean inner barrel—is secured by the water passing through and washing the barrel clean and free of all foreign substances. 2. When the coring operation begins the ports automatically close and force the liquid to pass around the inner barrel and to the Bit. 3. The position of the valve in the top of the barrel keeps the pressure from holding the ball down. This permits the soft sand core to enter the barrel without resistance while a vent carries off the air and liquid.

Type "M" Cutter Head

★ By use of the Type "M" Bit Body ROLLER CUTTER HEADS can be used with Brewster Core Barrels.

THE BREWSTER COMPANY, INC.
SHREVEPORT, LOUISIANA

★ *Warehouses:* The Iverson Specialty Co., Oklahoma City, Phone 2-2833; The Brewster Houston Store, 2000 Harrington St., Capitol 2031; Longview, Texas, 313 E. Cotton Street, Phone 781. *Export Distributors:* Acme Well Supply Co., Inc., 136 Liberty St., New York City.

The OIL and GAS JOURNAL

PRODUCING REFINING PIPELINE ENGINEERING MARKETING

Published Weekly by

THE PETROLEUM PUBLISHING COMPANY

114-116 West Second Street, Tulsa, Oklahoma

P. C. LAUINGER, President
JOHN M. EGAN, General Manager
JAMES McINTYRE, Editor
ANDREW M. ROWLEY, Managing Editor
W. T. ANDERSON, Associate Editor
C. O. WILLSON, Refinery Editor

Established 1910, by PATRICK C. BOYLE

E. KLAPPENBACH, Advertising Manager
L. G. E. BIGNELL, Petroleum Engr. Editor
C. K. FRANCIS, Ph.D., Technical Editor
W. T. ZIEGENHAIN, Associate Editor
THOMAS F. SMILEY, Associate Editor
SIMON H. ROURKE, Circulation Manager

Branch Editorial Offices

CANADA, Victor Lauriston — HOUSTON, Neil Williams — SAN ANTONIO, B. D. Stevenson
CHICAGO, Robert C. Conine — LOS ANGELES, L. P. Stockman — SHREVEPORT, J. R. Crumpton
DENVER, Tolbert R. Ingram — NEW YORK, A. E. Mockler — TOLEDO, George A. Whitney
FT. WORTH, L. E. Bredberg — OIL CITY, Leon H. Walter — WASHINGTON, C. E. Kern

Branch Advertising Offices

NEW YORK CITY, C. L. Cain — CHICAGO, C. R. Farmer — CLEVELAND, Howard Markt

(For representatives' complete addresses, see contents page)

Member, Audit Bureau of Circulations

Don't Lose Step

The manufacturing branches of the oil business just now have an excellent opportunity to contribute their share toward bringing about more prosperous times and at the same time benefit themselves.

The oil industry has as much, or more, at stake in facilitating the return to normal business conditions as any other industry. Through 1930-1931 when demand for other commodities declined precipitously the oil business was fortunate to have a carry-over demand for its products, due to motor vehicles already in operation, which made it possible to establish a new peak in domestic consumption of its principal product as late as 1931.

But in recent months it has become apparent that the oil business will join other industries in suffering a substantial loss in demand unless general conditions improve. New car production is not offsetting the junking of old cars and gasoline consumption will continue the decline of the past few months unless car production is stimulated by a return to normal conditions.

Refiners and other branches of the manufacturing industry are today in position where they can replace present equipment which is now obsolescent for various reasons at prices which, based on comparable capacity, are from 25 to 75 per cent less than the cost of their old equipment when it was installed.

This is due in part to the lower cost of steel and other materials used in the building of refinery equipment, but it is primarily due to improvements in design which have added greatly to the capacity of refining equipment, which means, for example, that it is now possible to build a 3,000-bbl. distillation unit for the same amount that a few years ago would have had to be spent on a 1,000-bbl. capacity plant.

This development in equipment has made possible not only a large increase in capacity but has also reduced operating costs. The modern combination units in distillation processing, at both high and low pressures and temperatures, are so designed that maximum fuel efficiency is obtainable.

The condenser equipment which formerly represented wasted heat —one of the largest factors in the cost of refining operations—is now utilized in preheating and other essential phases of plant operation.

Improvement in furnace design, which has been revolutionary in character, has placed that phase of petroleum distillation on a parity with the most efficient boiler house practice.

Pumps, heat exchangers, tankage, condensers, control instruments and all other equipment have been perfected to the point not thought possible a few years ago.

The net result of these improvements and changes in all the more important stages of refinery operation is a much lower cost of investment and a much greater operating efficiency when compared with old equipment installed as recently as three years ago.

It places the average refiner in position of having to choose between continuing to lose money with this old equipment or making necessary expenditures in purchasing the new equipment which will place him on a cost basis comparable with his strongest competitor.

Then there is the additional factor of quality of product. The new equipment now available is not only a factor in substantial savings in investment and operating costs, but it also produces a product to meet the new requirements of the consuming trade.

This is particularly true from the standpoint of antiknock rating. While the depression, which this year has brought about an approximate decline of 75 per cent in new car registrations, has lessened the expected consumption there is nothing to indicate that the necessity for high antiknock gasoline will not continue.

The trend in motor design is still towards higher compression ratios and today's cars will not operate satisfactorily with yesterday's motor fuel.

With the return of better business conditions it is certain that new car production with high compression motors will return to normal proportions which will strongly emphasize the necessity for better motor fuel.

The refiner, who at this time is in financial position to do so, has the opportunity to make ready for this new demand at costs which will not be lower and which all authorities agree will be higher later.

In doing so he will not only put his own business in condition to take advantage of the new requirements in gasoline but will assist those with whom he does business and thereby contribute to the general business revival from which his own business will profit as much, and probably more, than any other.

The industry has everything to gain and nothing to lose by encouraging progress in design and operation in its manufacturing branches, because these changes have consistently made a better product at a lower cost, largely accounting for the rapid expansion of the automotive industry and industries using petroleum products.

Notwithstanding all that has been said about overdevelopment of the machine age and the somewhat simple-minded suggestions about a return to the horse and hand labor there is nothing in history to show justification for any such step backward.

The quicker, better and less costly way of doing something is bound to drive the less efficient and more costly into the discard.

This is specially true where the better way produces a better product or a product that the other method cannot produce, as in the case of modern motor fuel.

There has never been a time since steam introduced the industrial age that there have not been those who have deplored the march of progress, lamenting the displacement of labor and the necessity for new expenditures, but the resulting expansion in industry and business has much more than compensated for both.

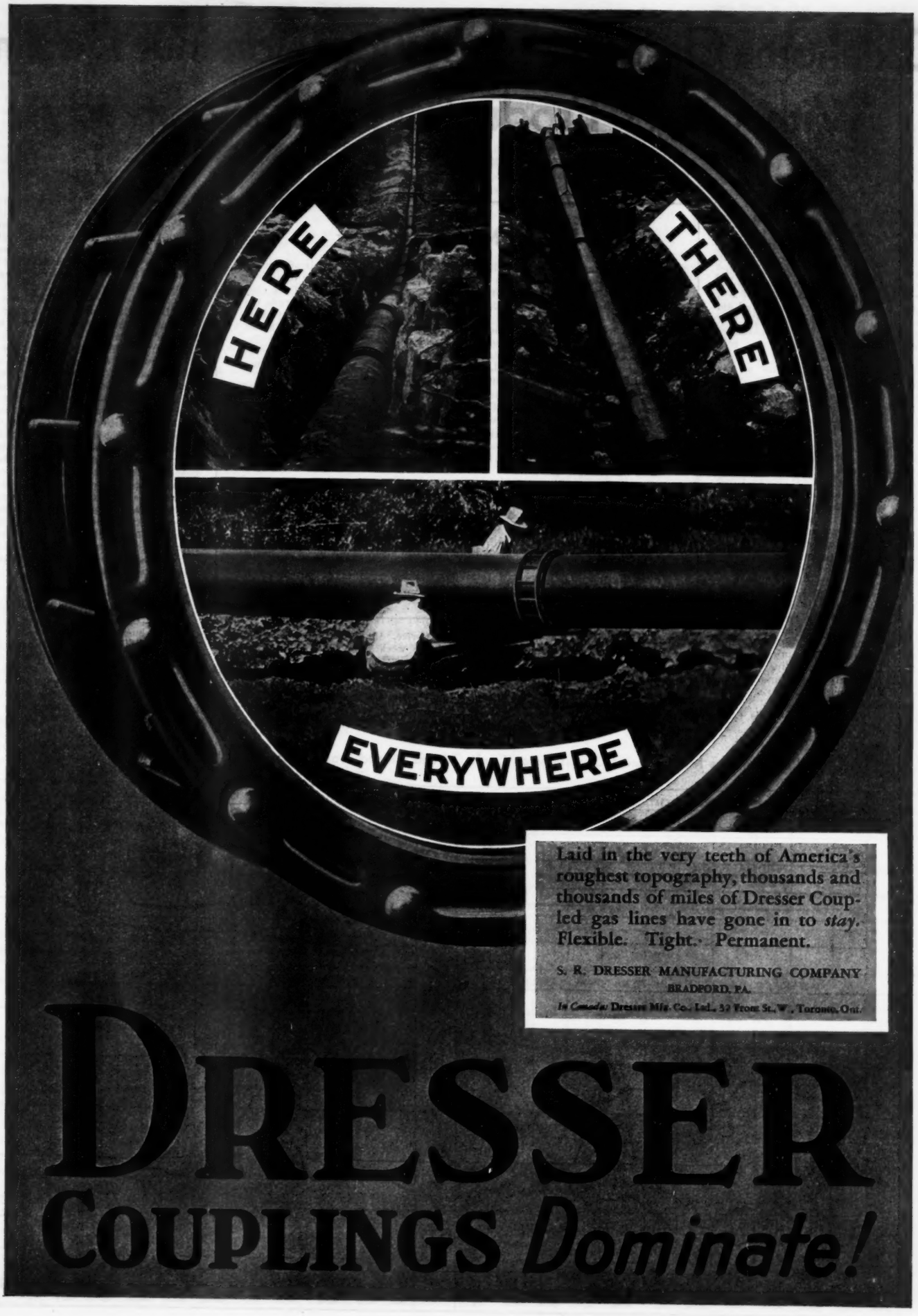
Every contribution to scientific development and technical progress in crude oil production and in the manufacture of its finished products is a step towards the final stabilization of the oil business.

An industry whose operations are so simple that anyone can participate in it with an investment of a few hundreds or thousands of dollars will never be on a sound basis.

The time is not far distant when the products of a skimming plant will be outlawed by the consumer because that fuel cannot meet the requirements of motor car users and other consumers of the product.

The modern refinery equipped with up-to-date equipment will not only make better products but at a substantially lower cost.

Based on the experience of the past year and of many times previous everyone will agree that the sooner this period arrives the better it will be for the established and permanent units in the oil business.


HERE
THERE
EVERYWHERE
Laid in the very teeth of America's roughest topography, thousands and thousands of miles of Dresser Coupled gas lines have gone in to *stay*. Flexible. Tight. Permanent.
S. R. DRESSER MANUFACTURING COMPANY
BRADFORD, PA.
In Canada: Dresser Mfg. Co., Ltd., 52 Front St., W., Toronto, Ont.
DRESSER
COUPLINGS *Dominate!*

Oklahoma Gasoline Quotations Continue Decline With Other Products Generally Steady

By C. O. WILLSON

Despite efforts being made to correct conditions which have been responsible for the reductions in gasoline tank car prices since late August, quotations continued to decline in the Oklahoma (Group 3) and the Middle West generally during the past week. The low octane U. S. Motor gasoline dropped to a low of 3½ cents the latter part of last week and did not improve the first few days of the new month. Except for the refinery gasolines the Oklahoma refinery market was generally steady with all grades of fuels maintaining their firm position of the past several weeks.

The principal development of the past week so far as refinery gasolines were concerned was the sale of low octane U. S. Motor gasoline by an Oklahoma refiner. The recent declines in the gasoline market which is now 1½ cents under the summer high, have been largely led by refiners supplied with East Texas crude oil. Chaotic conditions in the latter area have made substantial quantities of crude oil available under the posted prices and with increased crude runs to stills excess supplies were thrown on the market at constantly lower price levels.

Last week, just at a time when it appeared some semblance of order was to be obtained in East Texas, the Oklahoma refiner who ordinarily is not an active factor in the spot gasoline market, offered through brokers a substantial quantity of gasoline for immediate shipment. The gasoline which met the requirements of low octane U. S. Motor gasoline was sold at 3¼ and 3⅜ cents basis Group 3. The gasoline sold is reported to have totaled between 200 and 300 cars.

The unexpected dumping of this gasoline was reflected in the gasoline tank car market throughout the Middle West and Mid-Continent. Most refiners did not attempt to meet the prices at which the gasoline was sold but it stopped the regular spot movement of several competitors. Refiners having material which they had to move immediately in all parts of the Mid-Continent, were forced to meet the price. It was understood the first of the week that no gasoline would be offered by the refiner at this time. However, it will be several days before the gasoline will be absorbed by the jobbing and brokerage trade and the gasoline cease to be a spot market factor.

The ultimate market significance of the company's action is variously interpreted in trade circles. Some in touch with the market believe that it is a forerunner of similar action on the part of several companies unless there is an immediate change in the outlook for the Mid-Continent industry. This company along with many of the other large and small refining companies of the Mid-Continent, have curtailed their plant operations for many months and made other sacrifices including the purchase of distress gasoline offered on spot market, in order to carry out a program of keeping supply in line with demand and prevent price demoralization. It is assumed that this company as is the case with several other operators, ended the summer gasoline consuming season with more gasoline storage than needed. The decision to sell followed the collapse in East Texas and it became apparent that all the efforts to stabilize gasoline markets might prove futile. It is known that other companies are tiring of their long efforts to cope with situations brought about in part by oil produced in excess of proration allowables, bootleg gasoline and similar types of operations carried on by a small minority but which nevertheless are a constance menace to orderly operations.

Conditions May Improve

At this writing efforts are being made to rectify the conditions in the Mid-Continent oil business which have been directly responsible for the weakness in the gasoline market over the past several months. A program which has strong support within the industry with the backing of civil authorities calls for a reduction of around 15 per cent in the present crude oil production of Oklahoma, Kansas and

Refined Market Barometer

An improvement in the California retail market as the result of increasing the price of the third grade of motor fuel 1 cent was the only optimistic development in the refined oil market in the past week. New declines elsewhere continued to be reported. The open discussion of a possible crude cut in the Mid-Continent coupled with price reductions in the Pennsylvania area has weakened gasoline prices at the refineries in practically all areas. Natural gasoline has also shared in this decline. Fuel oil, kerosene and distillates have been traded in slightly greater volume and last week's prices have been generally maintained. Lubricants, particularly bright stock, were quoted fractionally lower in Pennsylvania.

Mid-Continent—Refinery and natural gasoline prices fractionally lower. Kerosene and distillates firm. Fuel moving in larger volume but no efforts made to increase price. Motor oils, bright stocks and wax weak.

East Coast—Minor adjustments were made in the motor fuel prices along the Eastern Seaboard these being principally downward. Furnace oils moved in larger volume but prices were unchanged. Price reductions were posted on cylinder stocks.

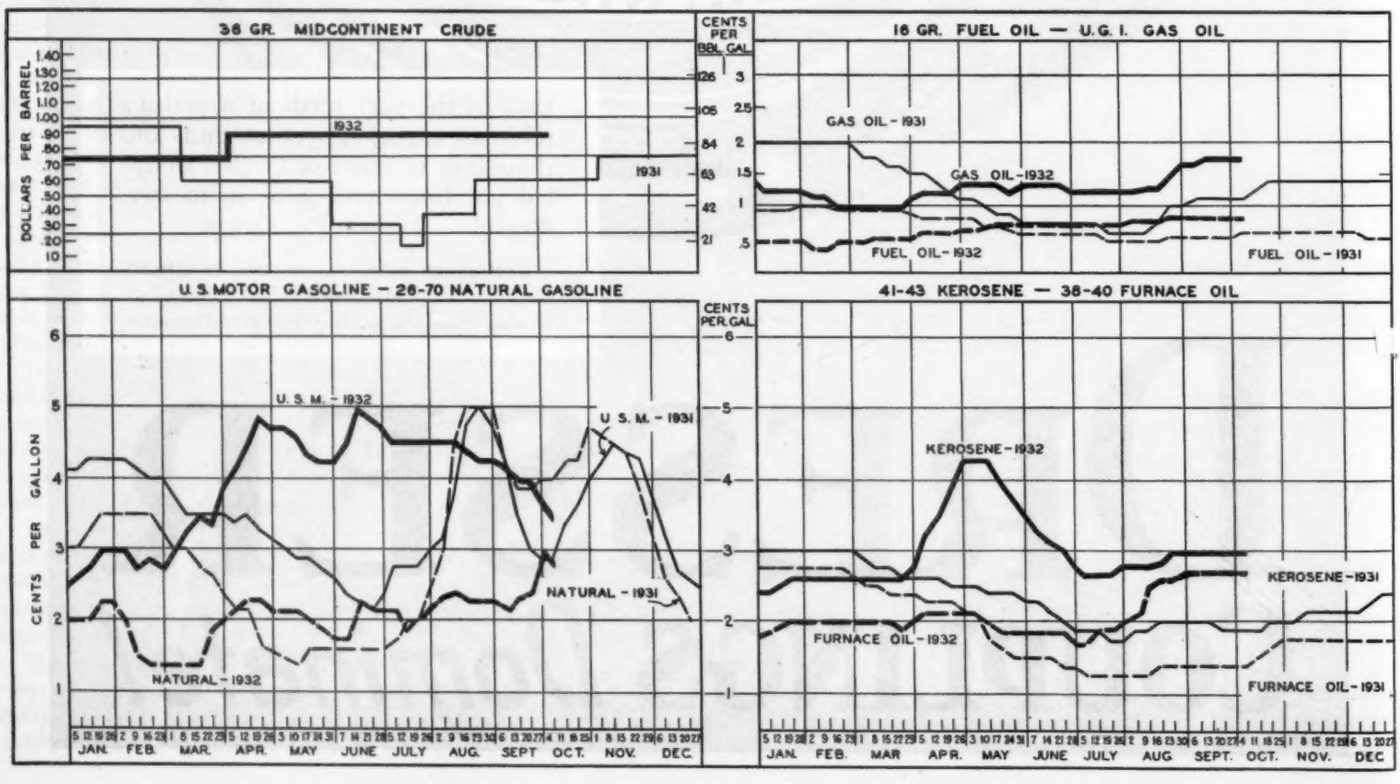
Chicago—Refiners are less willing to quote today's price for future deliveries and general belief is that a turn upward in gasoline quotations will result. Kerosene and distillates are moving in larger volumes.

Pennsylvania—High cold test bright stocks and lubricants were reduced in price. Motor fuel market also declined fractionally.

Gulf Coast—Gasoline and red oils declined fractionally but hope for a turn is developing as exports improve in volume.

California—The improved retail market has encouraged purchases of motor fuel and kerosene with prices fractionally higher.

Representative Mid-Continent Quotations on Crude Oil and Refined Products Basis Oklahoma (Group 3)


36 GR. MIDCONTINENT CRUDE
DOLLARS PER BARREL
1932
1931
CENTS PER BBL.
CENTS PER GAL.
16 GR. FUEL OIL — U.G.I. GAS OIL
GAS OIL - 1931
GAS OIL - 1932
FUEL OIL - 1932
FUEL OIL - 1931
U.S. MOTOR GASOLINE — 26-70 NATURAL GASOLINE
CENTS PER GALLON
U.S.M. - 1932
U.S.M. - 1931
NATURAL - 1931
NATURAL - 1932
41-43 KEROSENE — 38-40 FURNACE OIL
KEROSENE - 1932
KEROSENE - 1931
FURNACE OIL - 1932
FURNACE OIL - 1931
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Texas with possible curtailments in adjoining states with smaller crude oil production. What is equally important, those sponsoring the plan for the balancing of supply and demand for the winter months in line with the decline in latter state that they have adequate plans to cope with the "outlaw" element of the oil business. The latter includes those who have produced crude oil in violation of proration orders, and either sell it under the posted prices or run it through their own refineries. It also involves the actual theft of crude oil without the knowledge of well owners, a practice which is said to have become quite widespread in East Texas. Finally a special effort is to be made to minimize the demoralizing results of state and Federal gasoline tax evasions.

These developments are mentioned here because of their direct relationship to refinery markets. Competent market students are in agreement that no improvement in tank car and retail markets are possible until the crude oil situation is again in hand. The latter in the future must mean not only the reduction in the visible supplies but also the invisible commonly called "midnight oil."

"The oil business has reached the point where its future prosperity depends more on the enforcement of laws than anything else," one refiner said last week. "The great majority of people in the business have become convinced of the necessity of restricting all types of operations from the wells to the filling stations in line with the requirements of consumption and they favor proration of flush fields and curtailment of refinery operations. But this majority is helpless and the whole plan is certain to fail unless the state regulations which aim to place all on the same basis are enforced."

The next week or 10 days should determine whether the curtailment plan will be successful. The recent reductions in the per well allowable in East Texas are known to have shut off some cheap crude oil supplies for local and outside refineries and less is heard of the cheap crude oil available. The Oklahoma situation has been in much better shape in recent weeks and little complaint is heard from other states.

So far as the refinery gasoline market is concerned these efforts to correct basic conditions in the Mid-Continent industry are coming "after the horse is stolen." However, many of the sellers are confident that as soon as the changes in the crude oil situation are brought about, refinery prices will stiffen and much of the lost ground will be recovered in both tank car and retail prices. These optimists do not attempt to minimize the unsatisfactory conditions existing in retail markets, a condition brought about by more than seasonal declines in gasoline demand, tax evasion and a declining spot tank car market.

Gasoline and Naphtha

Those selling direct to the trade in most cases are selling their low octane U. S. Motor gasoline over a price range of 3½ to 4 cents. The movement has been slow for most refiners due to the confusion on the part of jobbers as to the probable future price trends.

Prices on the higher gravity and low endpoint gasolines are off from one-eighth to one-fourth cent. Weakness is largely confined to the low octane U. S. Motor grade but the higher gravities and the high octane material generally have to follow the least desirable grade a day or two after the latter has been reduced. More inquiries for 375, 350 and 360 endpoint grades were reported during the past week. Naphtha prices are one-fourth cent lower.

Natural Gasolines

Natural gasolines reacted slightly from the rapid advance of the previous week. As was expected some of the buyers did not take kindly to the advances in a product which has been on the bargain counter most of the time over the past year. The demand for the lower vapor pressure grades has fallen off and this has resulted in a corresponding increase in the production of the 26-70 grade. The weakness in the refinery gasolines largely accounts for this situation. Jobbers who have been buying the low vapor pressure grades now find the quotations as much or more than the prevailing market for the low octane U. S. Motor. Where price is the only factor considered by the buyers, the U. S. Motor is now being favored. This forces the manufacturers to shift their production to the 26-70 and other higher vapor pressure grades. It is thus apparent that the future of the natural market is directly tied up with the refinery developments of the next two weeks.

The 26-70 grade was selling the first of the week at a price range of 2⅞ to 3 cents with one-eighth cent concession for delivery over the month. Other grades were one-eighth cent under last week's quotations except the 11-pound material which continued to be quoted at a low of 4 cents.

Other Products

No important price changes were reported in residual fuels, gas oils and distillates. Some of the low cold test grades are unobtainable in Oklahoma with a marked scarcity throughout the Mid-Continent and Middle West. Among the buyers for low cold test furnace oils are refiners who do not have sufficient production at their own plants to take care of their regular trade. The 32-36, light or dark straw, under 190 flash with zero cold test is particularly strong. Buying of the prime white grades of distillates has largely shifted to East Texas.

The general attitude of the sellers at this time is that present quotations on bright stocks and steam refined stocks will not be lowered. There has been considerable seesawing between Mid-Continent and Pennsylvania in the bright stock market over the past month and it is hoped that this condition will be remedied. Wax prices are unchanged in Oklahoma.

Government Gives Tax Collection Data and Latest Rules Covering Kerosene

WASHINGTON, D. C., Oct. 1.—A statement of the Internal Revenue collections of the excise tax on lubricating oil, gasoline and pipe lines shows the following amounts: Lubricating oils, $822,775.50; gasoline, $8,944,875.38; pipe lines, $252,178.77, a total of $10,029,829.65.

The National Petroleum Association has received a communication from Deputy Commissioner R. M. Estes, located at Baltimore, Md., in respect to the taxability of kerosene, as follows:

"Reference is made to your letter of August 12, 1932, requesting a ruling on the taxability of ordinary kerosene and if so used in farm tractors the effect of the tax thereon.

"You are advised that it is the opinion of this office that ordinary kerosene the chief use of which is not the propulsion of motor vehicles, motor boats, airplanes is not subject to the tax imposed on gasoline under Section 617 of the Revenue Act of 1932. The above ruling also holds true when the kerosene is used in farm tractors, as tractors are not construed to be motor vehicles within the meaning of the law.

"However, if it is further compounded or processed until it becomes suitable for use as a fuel for the propulsion of motor vehicles, motor boats, or airplanes, the sales and uses of such a further compounded or processed product by the producer will be subject to the tax."

Gulf Coast Refined Oil Price Lower by Close of the Week

HOUSTON, Tex., Oct. 4.—A decidedly weaker trend in bulk fuels was the principal change in Gulf Coast refinery market the past week. This was felt in general lowering of quotations on fuel for cargo movement. The reductions now place bulk fuel more in line with the bunker postings, which were cut 10 cents a barrel several weeks ago to 60 cents. For a time after the bunker cut it was thought bulk fuels would hold, and a fairly firm tone has existed until now. However, the resale differential between the bulk price and the lower bunker postings naturally forced the bulk market to slip into line.

The domestic gasoline market still is somewhat uncertain. Higher octane material continues fairly steady in price despite weakening on the Atlantic seaboard, and very little of this product is available at coastal refineries under 5¼ cents. On the other hand, sales of low octane gasoline have been reduced to a minimum. No spot sales of any importance were made at all the past week. This gasoline is being offered as low as 4½ cents freely, but as far as a moving market is concerned that is a nominal price.

The export gasoline situation seems unchanged. Movement of gasoline out of coastal ports for export trade is confined to established outlets and there is a market in name only. Nominal quotations somewhat above the market as quoted f.o.b. coastal ports by foreign refiners still are maintained.

Gas oil and kerosenes are tight and prices strong. So little material is available from sources here that sellers control the picture despite the fact that material can be shipped in from North Texas and Group 3 at figures a little under the coastal market.

Lubricating oils still are not finding any demand and sellers are content with only an occasional tank car sale. At the same time quotations are fairly steady as the present situation is considered one not of price but rather one in which buyers have ample material in stock to meet all requirements and have no occasion to buy at any figure.

American Petroleum Institute Weekly Refinery Statistics

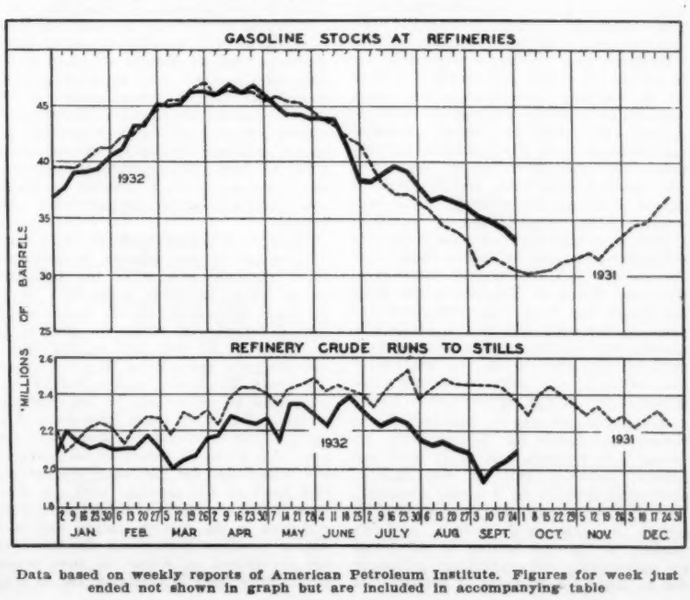
Figures below reported for week by American Petroleum Institute. (1) Per cent refinery capacity represented. (2) Daily average crude runs to stills. (3) Gasoline stocks. (4) Gas oil and fuel oil stocks. All figures in 42-gallon barrels.

Week Ending October 1, 1932, Compared to Week Ago

	Week ending October 1				Week ending September 24			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	99.1	444,000	4,428,000	9,290,000	99.1	443,000	4,603,000	9,285,000
Appalachian	95.0	80,000	978,000	943,000	95.0	88,000	1,017,000	1,008,000
Ind., Ill., Ky.	97.5	281,000	3,673,000	4,184,000	97.5	278,000	3,880,000	4,299,000
Okla., Kans., Mo.	89.4	211,000	2,948,000	3,250,000	88.4	224,000	2,967,000	3,189,000
Tex. Gulf	98 4	375,000	4,477,000	10,405,000	98.2	385,000	4,716,000	10,493,000
La. Gulf	97.3	72,000	1,243,000	4,216,000	97.3	86,000	1,283,000	4,462,000
Inland Texas	72.1	91,000	1,043,000	2,057,000	72.1	85,000	1,092,000	2,079,000
N. La. and Ark.	94.6	39,000	105,000	565,000	94.6	43,000	95,000	580,000
Rocky Mtn.	91.4	26,000	1,302,000	492,000	91.4	31,000	1,375,000	516,000
California	94.6	435,000	12,210,000	100,270,000	94.6	441,000	12,544,000	100,151,000
Total U. S.	93.6	2,054,000	32,407,000	135,672,000	93.6	2,104,000	33,572,000	136,062,000

Week Ending October 1, 1932, Compared to Year Ago

	Week ending October 1				Week ending October 3, 1931			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	99.1	444,000	4,428,000	9,290,000	100.0	473,300	3,772,000	10,819,000
Appalachian	95.0	80,000	978,000	943,000	91.8	107,400	1,285,000	1,628,000
Ind., Ill., Ky.	97.5	281,000	3,673,000	4,184,000	98 9	319,400	3,641,000	4,994,000
Okla., Kans., Mo.	89.4	211,000	2,948,000	3,250,000	89.6	245,700	2,808,000	5,003,000
Tex. Gulf	98 4	375,000	4,477,000	10,405,000	99.8	408,300	3,939,000	8,270,000
La. Gulf	97.3	72,000	1,243,000	4,216,000	100.0	110,000	601,000	2,486,000
Inland Texas	72.1	91,000	1,043,000	2,057,000	.....	107,900	1,268,000	3,337,000
N. La. and Ark.	94 6	39,000	105,000	565,000	.....	51,300	223,000	976,000
Rocky Mtn.	91.4	26,000	1,302,000	492,000	89.3	44,200	1,231,000	800,000
California	94.6	435,000	12,210,000	100,270,000	96.5	423,400	11,610,000	97,287,000
Total U. S.	93.6	2,054,000	32,407,000	135,672,000	95.0	2,290,900	30,368,000	135,530,000



Data based on weekly reports of American Petroleum Institute. Figures for week just ended not shown in graph but are included in accompanying table

Developments in Chicago Area Tend to Create More Cheerful Feeling Among Marketers

By ROBERT C. CONINE
Chicago Bureau, The Oil and Gas Journal

CHICAGO, Oct. 3.—Factors which last week permitted some observers to discount the tales of woe heard in most marketing and refining quarters are now more apparent, and although inertia will prevent the refined products tank car markets from reflecting improved conditions in the industry immediately, there is already evident a tendency on the part of a growing number of refiners and distributors to refrain from selling very far ahead on a flat price basis. Refiners, it is true, have begun here and there the practice of selling through brokers at subnormal prices, but it is to be noted that the prices are for immediate shipment and the buyer is offered a consideration of 60 octane in the gasoline classed in the 57-64 octane range for prompt instructions. Another point to be considered is the fact that while one or two refiners may be accused of dumping gasoline, principally the third grade, on the Mid-Continent markets, a large number of refiners are practically out of the markets. This includes several operators whose materials have been offered consistently at prices below the ruling ranges.

One of the latest developments with a heartening influence to Chicago district oil trade circles and throughout the adjoining territory is the anticipated elimination of an unfavorable marketing practice of one of the larger refining and marketing companies. According to reliable information the contract which this marketer made with one of the largest distributors in the district in which the distributor was given a price of three-eighths of a cent below the low of daily published quotations on gasoline for resale expired in September. There is every indication, it is said, that the contract will not be renewed.

Contracts Based on Published Prices

The significance of this development becomes clearly apparent when the situation which has arisen because of this contract is explained. Most of the distributors' and jobbers' contracts are based on the price ranges carried daily in a Chicago newspaper. For competitive reasons the contract in question leveled the actual low of the gasoline markets to a point three-eighths of a cent below the published low to the trade. The price to the trade on the basis of resale price of three-eighths of a cent under the low ranges from an eighth of a cent to a quarter of a cent below the published price to the trade. Thus, with the low of U. S. Motor (no octane specification) listed at 3⅝ cents, the price for resale has been 3¼ cents, and the price to the trade 3⅜ to 3½ cents. Obviously the downward trend in a large part of the business in this section of the territory continues with every attempt to list actual representative prices.

A constructive step on the part of the refiner responsible for this contract, reported now expired, will in at least one known instance halt a contemplated downward revision by a major company. The idea that one can lose money by selling in subnormal refined products markets or by not selling at all needs no exposition, and shrinking gallonage due to lower consumption or activities of competitors on the service station end has apparently weakened the resolve of certain majors and semimajors to remain out of the spot markets. One major who has little business outside of dealer accounts has ignored the published prices up to now, but the continued downward trend in these prices, according to officials, has dictated a cut of half a cent a gallon in the tank car prices of the regular and third grade gasolines to their accounts.

Third Grade Billing Innovation

Another major company, which has billed jobbers on the third grade gasoline at the average of the published range of prices for the no octane specifications material, has recently introduced a system of billing these jobbers on the third grade on the basis of the existing spread between Red Crown (Standard of Indiana) and Stanolind (third grade). When the spread between Red Crown and Stanolind is less than 3 cents the jobber is billed the low of the published price range. When the spread between Red Crown and Stanolind is 3 to 3.9 cents the jobber is billed at one-half cent below the low of the price range. When the spread between Red Crown and Stanolind is 4 cents or more, the jobber is billed at three-quarters of a cent under the low of the published price range.

To give an idea of what this means, take the markets at St. Joseph, Mo. The spread between Red Crown and Stanolind is 5.1 cents, and the published range taken is 3⅝ to 4 cents, Group 3. On the old basis the jobber would be billed 3.8125 cents, Group 3, or the average. Under the new system the existence of a spread of more than 4 cents brings a price of three-quarters of a cent below the low of 3.625 cents, or 2.875 cents, Group 3. This represents a cut of 0.9375 cent to the jobber. If the refiner who is contemplating a cut of half a cent in his tank car price to dealers carries it out the new prices will be 3.75 cents on 57 octane material, and 4.625 cents on 68 plus octane gasoline.

Important Companies Involved

It is to be noted that major and semimajor companies are involved in these adverse developments. It is not likely that the excuse of pressing necessity to liquidate stocks will be offered, and it is the belief in Chicago district oil trade circles that the problem now is much simpler than that offered when small refiners were flooding the markets. A survey of current conditions shows a greatly improved attitude among the minor operators. At least, these operators appear to be giving little or no trouble as far as the Chicago district markets are concerned.

Gasoline reported to have come from one of the larger refiners is being offered through brokers at the following prices, plus the usual commission of $5 per car: 60° gravity U. S. Motor of below 57 octane, 3⅜ cents; 60° gravity U. S. Motor of 57 plus octane, 3⅝ cents; 400 endpoint gasoline of 65 plus octane, 3⅞ cents. The broker states that he may guarantee 60 octane on the 3⅝-cent material if the buyer takes immediate shipment. These developments, more than any fear of a break in the crude oil markets, are responsible for the softer appearance this week of the gasoline tank car markets in this district. Continued downward revisions in the service station and tank wagon postings throughout the territory are recognized as moves to meet prices which have been in existence for as long as several months. These revisions are expected to prove constructive in the long run, as such an action on the part of a major company may cause those operators who have "run wild" in the price cutting business to turn to a serious study of marketing possibilities and the errors of selling on a price competition basis exclusively.

Meeting Local Price Cuts

At least 25 price cuts have been made at the principal points in the territory. The cuts and the dates are as follows: Regular grade postings: Decatur, Ill., cut from 17.6 cents to 15.6 cents, September 20; Joliet, cut from 17.6 cents to 15.6 cents, September 26; Peoria, cut from 17.6 cents to 15.6 cents, September 26; Quincy, cut from 17.4 cents to 15 cents, September 27; Detroit, cut from 12.6 cents to 12.5 cents, September 14; Grand Rapids, cut from 16.5 cents to 14.5 cents, September 20, tank wagon was cut from 17.5 cents to 14.5 cents, September 24; South Bend, cut from 18.7 cents to 16.7 cents, September 24; St. Louis, cut from 14.6 cents to 11 cents, September 24.

The cuts in the third grade gasoline were more numerous and are as follows: Service station: Decatur, cut from 15 cents to 14 cents, September 26; Joliet, cut from 15.6 cents to 14 cents, September 26; Peoria, cut from 15 cents to 14 cents, September 26; Quincy, cut from 12.5 cents to 10.5 cents, September 27; St. Joseph, cut from 11 cents to 9.9 cents, September 19; Evansville, cut from 15 cents to 14 cents, September 17; Fargo, cut from 16.1 cents to 15 cents, September 20; Bartlesville, cut from 15 cents to 14 cents, September 21; South Bend, cut from 17.2 cents to 16 cents, September 22.

Tank wagon cuts: St. Joseph, cut from 12.1 cents to 9.9 cents, September 27; St. Louis, cut from 13.6 cents to 11 6 cents, September 13; Grand Rapids, cut from 15.7 cents to 14.3 cents on September 21, and to 12.5 cents, September 27; Mankato, cut from 15.1 cents to 14.5 cents, September 21; Minneapolis, cut from 14.1 cents to 11.9 cents, September 27; Milwaukee, cut from 15.3 cents to 14.3 cents, September 16; Bartlesville, cut from 15 cents to 13 cents, September 21.

Expect Better Market Support

These developments should not be considered in the light of activities following in the train of new adverse conditions. Low priced tank car gasoline has supported these price cutting activities for many months. Price cutting service station operators have worked on a narrow profit margin in spite of the low wholesale prices available to them either from the usual underselling refiner or from blenders of natural gasoline and naphtha.

As the ruling gasoline tank car markets now stand, according to observers, the advantage to price cutters is certainly nothing to encourage them. Now with the major and semimajor companies determined to meet the price cutters at every step, the outlook for the price competition exponent is not a happy one. The remedy appears drastic, but all other means of ironing out a serious defect in the marketing setup in the territory has borne no fruit. On the contrary, the regular priced operators were losing gallonage for reasons other than lowered consumption.

One difference between the larger company's station and the station of the small independent in the matter of overhead cost of operation, to point out only one, is seen in the fact that attendants at the larger company's station are union members and must be paid on a scale ranging from $80 to around $150 a month, while at several independent service stations checked the nonunion attendants were receiving as low as $8 a week.

Price competition has apparently not favored a number of operators. These operators have been unable to pay wages and have turned the station over to the attendants on a commission basis. These considerations are eliminating the bearish attitude which formerly was general among this type of operator and the jobbers and distributors catering to this trade. Yellow ladings have certainly become a nightmare.

Crude Oil Outlook Brightens

The same psychology is apparently working in the matter of crude oil prices and overproduction. The threat of a cut in the price of crude has been magnified by widespread downward revisions in gasoline retail and wholesale markets and efforts to hold down crude oil production to the figures recommended by The Oil and Gas Journal have received additional stimulus. There is a very definite feeling in Oklahoma, Texas and Kansas against a reduction in the crude oil price structure, and this is believed to be an indication that action will be taken immediately to eliminate the factors which are threatening the crude markets. It is reported that rapid progress has been made in East Texas in shutting off the flow of illegally produced crude. At least 75 per cent of this oil production has been stopped, it is reported.

A bill recently signed by the Texas governor defines the crude oil bootleg operations as a criminal act punishable as such. It is reported from the same quarters that refiners who have operated on "stolen" crude oil have oversold and have little gasoline available. The result, it is said, is that there is far better prospects for an advance in the crude oil markets than for a decline. Current prices from Texas refineries indicate a strengthening movement.

Favorable Motoring Weather Continues

While the season of peak gasoline consumption is over, weather conditions have continued favorable for motoring with occasional cool mornings which served as reminders to stock up with heating oils. Some abatement in traffic may be expected, but the decline does not promise to carry out the lugubrious predictions heard in some quarters.

Jobbers are still far from taking an active buying position in the gasoline tank car markets, but that is usual when the markets are apparently on the down side. If the "about face" in the gasoline markets which is indicated in recent developments materializes this week there should be a sizeable pick up in jobber buying.

While the kerosene, distillate and fuel oil markets continue as strong as ever, the improved crude oil outlook is expected to send these materials on another upward march. In fact, certain fuel advances will be noted later. Most of the Chicago distributors freely admit that they are having difficulty in locating quantities of certain distillates and fuel oils. While blending naphthas have responded to the recent lowering of the gasoline markets, natural gasolines are

(Continued on Page 69)

New England Markets Follow Gasoline Price Cut Made By Standard Oil Co. of New Jersey

By A. E. MOCKLER
New York Bureau, The Oil and Gas Journal

NEW YORK, Oct. 3.—The past week was one of general readjustment in East Coast territory, with the remainder of the industry falling into line with the revised gasoline quotations made effective during the preceding week by Standard Oil Co. of New Jersey and other refiners and marketers operating in Jersey's territory. Atlantic Refining and Standard of Pennsylvania in midweek revised tank wagon and service station gasoline prices in Pennsylvania and Delaware, in line with the lower market in other points in the territory, and later in the week Standard Oil Co. of New York and other factors in New York and New England revised their tank wagon and service station prices, as well as tank car markets, to meet the lower prices established in other parts of the East Coast area.

Although market interest was centering almost wholly in the gasoline situation, considerable more activity developed in the furnace oil market, and gallonage showed a sharp jump both in refinery and tank wagon markets.

In the face of the drastic cuts in refinery gasoline prices during the past fortnight, the statistical position of the East Coast gasoline market has shown continued improvement, indicating the likelihood of an upward movement in tank car prices as soon as it becomes evident that the drastic cut by the major interests has achieved its purposes. Total holdings of the motor fuel at East Coast refineries and bulk terminals (including stocks in transit for this area) amounted to but 14,356,000 bbls. on September 24. This was a substantial drop from the 15,928,000 bbls. visible supply at the start of the month and with refineries in this area operating at less than 70 per cent of capacity and further curtailment in operating schedules looked for during the closing quarter of the year a further strengthening in the statistical position of the motor fuel market is indicated.

The sharp price cuts in both refinery and tank wagon markets during the past fortnight have had the effect of stabilizing retail markets, but as this action involved the dropping of prices by the major marketers to meet the low prices for off grades by price cutters, the result is a rather hollow victory. At present price levels, however, it is a question as to how long the price cutters will be able to get supplies, as present retail prices leave little or no margin, and there is some indication of a possible upward readjustment of prices to the point where a satisfactory "trading level," somewhere between what good gasoline is actually worth and the price necessary to compete with off grades, may be reached.

Refinery Gasoline

Tank car quotations were lowered in New England markets during the week, in line with the lower quotations named at Bayonne and other coast market centers. The Boston market was posted at 5¼ cents for U. S. Motor gasoline under 65 octane number and 6 cents per gallon for 65 octane number and above. The half-cent allowance to contract buyers on the high octane gasoline, established at Bayonne and several other points in the southern part of the territory, has not developed in New England as yet, however.

There were no changes reported at Bayonne or at southern marketing points during the week, aside from the action of several other refiners in meeting the reductions inaugurated by Standard of New Jersey. The Philadelphia bulk market has also been cut, in line with prices quoted at competing tank car terminal centers.

Jobbing demand for gasoline received considerable impetus from the reduced prices, and although there were rumors of possible further shading in tank car prices, it is generally felt in market circles that current quotations are at rock bottom for the year, even though crude prices may be cut 25 cents per barrel before the year is out. In some quarters, the belief prevails that current low prices for high octane gasoline will be short-lived, and that an increase will be named in the near future by the major sellers. There is nothing definite to back up this theory, however, and current indications are that prices will remain pegged at their current low levels until the general market position shows undisputed evidence of real stability.

With cold weather at hand, refiners and marketers are attempting to devise ways and means of stimulating their gallonage on premium gasoline, which has suffered from general neglect during the summer season's battle for gallonage on regular and third grades.

Several cargoes of foreign painters' naphtha and cleaners' solvent are expected to reach the Atlantic Coast area during the next few months, and considerable demand for casinghead gasoline is looked for to be blended with these products to make them suitable for distribution as motor fuels. It is possible, however, that the recent sharp price cuts in tank car motor fuel prices may serve to stop these imports.

Tank Wagon Gasoline

Atlantic Refining Co. during the week reduced tank wagon and service station gasoline prices 1 cent per gallon in eastern Pennsylvania, Delaware and the metropolitan area of Philadelphia, and 1½ cents per gallon in western Pennsylvania. Standard Oil Co. of Pennsylvania and other marketers in this territory followed in the reduction.

Effective September 28, Standard Oil Co. of New York, Inc., operating subsidiary of the Socony-Vacuum Corp., initiated price reductions in New York and New England, with other sellers following in the price cuts. The price cut in metropolitan New York was 1 cent per gallon and the same reduction applied to Buffalo and Albany. Reductions of 1 to 2 cents per gallon in tank wagon and service station prices were made at principal New England points.

The downward revisions made in New York and New England were by no means as drastic as those put into effect in Standard of New Jersey territory, which ranged from 2.2 to 3.3 cents per gallon, and it is not yet evident whether the price cuts in this area will be of sufficient extent to bring prices down to a level fully meeting the quotations of the price cutters. However, price competition in this territory was not as drastic as that experienced in some sections of Jersey's territory, and with the present spread between tank car and tank wagon prices, there is still room for further cuts by the major marketers in the event that such action is deemed necessary.

Several sections of the territory have experienced some sharp weather during the past week, and interest in premium grades is on the recovery, stimulated by more sales support on the part of principal marketers. The price cuts on regular grades of gasoline have naturally been made on the premium grades as well, and although the spread of 3 cents per gallon between regular and premium grades continues in effect, the net price of the higher grade motor fuel is much lower than was the case a few weeks ago, and sales resistance has shown a corresponding slackening.

Kerosene

Jobbing demand showed a sharp spurt during the week, and considerable activity developed in the tank car market. Kerosene stocks are by no means heavy in this territory; in fact, some refiners have been bringing in supplemental supplies from their subsidiary or affiliated companies at the Gulf and in California. The tank car price of 5½ cents per gallon, f.o.b. terminals, is being adhered to by the principal sellers, and price shading is virtually nonexistent, in so far as the local market is concerned. Pennsylvania refiners are still quoting 4½ cents per gallon, however, and are thus enabled to cut into the business of coastal refiners to some extent at points where they enjoy a favorable freight differential.

Tank wagon kerosene prices have held steady and unchanged throughout the territory, and marketers reported a considerable increase in gallonage during the week. Kerosene is apparently being widely utilized for domestic heating purposes, and the use of this oil for cooking purposes in the rural areas is on the increase.

Furnace Oil

Tank car movement of furnace oil has picked up substantially as jobbers come into the market for supplies for their nearby requirements, and the market holds steady at recently revised prices. Spot 32-36 gravity oil is held at 4 cents per gallon, with 36-40 at 5 cents, and 21 gravity (industrial grade) at 3½ cents per gallon, all in tank cars, f.o.b. terminals.

Tank wagon prices remain unchanged, and the major distributors as yet have made no move to scale their prices down in line with recent reductions at refineries. A large part of the season's gallonage is already on the books of distributors in the form of seasonal contracts. Deliveries showed a sharp gain in gallonage last week, home owners filling their tanks for the start of the heating season.

Bunker Oil

Conditions in this division of the market showed no appreciable change last week, and refiners continued to quote bunker "C" at 75 cents per barrel in bulk at terminals at principal Atlantic ports, or 80 cents per barrel f.a.s. The possibility of an early reduction in domestic crude prices is coming in for consideration, however, and unless some definite developments are witnessed in the crude situation in the near future, it is expected that the price uncertainty will be reflected by a slowing placing of 1933 contracts on the part of large fuel oil consumers.

While the production and price compact between Rumanian producers and refiners and the American-European group of refiners has become effective, no increase in Rumanian export prices has been witnessed as yet, and fuel oil is still quoted f.o.b. Constanza at $3.58 per ton, still considerably under the American market, in so far as many of the chief consuming ports of Europe are concerned.

Diesel Oil

Industrial markets for Diesel oil are attaining increasing importance, and refiners are reporting considerable activity in tank car Diesel sales, with the market posted at 4 cents per gallon for 26-30 oil, although marine sales of course still constitute the great bulk of the total gallonage.

For marine consumption, the market is quoted unchanged at $1.65 per barrel in bulk f.o.b. refinery terminals, or $1.71½ per barrel f.a.s. Total volume with the shipping trade is holding up to expectations, and refiners are expected to start their 1933 contracting activities in the near future.

Gas Oil

With daylight saving at an end, there has been an increase in the demand for gas oil from the utility companies, and tank car movement is on the increase. Considerable progress has been made by eastern manufactured gas companies in developing an added gas load for domestic heating, and this is expected to be reflected by a material increase in gas consumption in many parts of the territory this year.

Refiners continue to post 4 cents per gallon for 28 gravity plus recycled oil, with contract deliveries moving out at an average price of 3½ cents per gallon in tank car lots. Some isolated instances of price cutting in the spot market are reported, with sellers in some cases going down to 3¾ cents on spot sales. California gas oil is moving eastward in fair volume.

Low grade gas oils are coming in for more attention now that the heating season is at hand, and considerable quantities are moving into consumption as domestic furnace oil.

Wax

A better feeling was again in evidence in the spot paraffin wax market, and the price undertone was a little firmer. Only one actual price advance materialized during the period, however, sellers quoting 130-132 a.m.p. fully refined at 3½ cents per pound, an advance of one-eighth cent over previous quotations.

Domestic consumers in a number of lines are showing more interest in wax for prompt and nearby delivery, and sellers are looking for a good volume during the next few months. Buyers normally contract for their requirements three to six months in advance, but this type of trading has not been general this year, and a number of large buyers still have their requirements for the balance of the year to cover.

Export inquiry for wax continued rather sluggish during the week, and was centering mostly on crude scale and the lower melting points of the fully refined grades.

Lubs

Sharp price reductions on a number of grades of cylinder oils featured the market last week, and business picked up somewhat on the reductions. Bright stocks sold sharply off, with No. 8 color at 27 cents per gallon and No. 6½ color, dil., at 26½ cents. On 650 s.r. unfiltered, the market was a half cent lower at 22½ cents per gallon, with 600 flash and 630

(Continued on Page 69)

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement except as otherwise noted

EXCLUSIVE OF TAXES

The following quotations are exclusive of the Federal excise taxes of 1 cent a gallon on gasoline and 4 cents on lubricating oils, which became effective June 21.

Gasolines

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
*U. S. Motor	.03½	.04	.03¾	.04½
60-62 400	.03¾	.04¼	.04	.04¼
64-66 390	.04	.04½	.04¼	.04½
64-66 375	.04¼	.04½	.04½	.04¾
68-70 350	.04½	.04¾	.04⅝	.04¾
NORTH TEXAS—				
*U. S. Motor	.03⅝	.03⅝	.03⅝	.03¾
60-62 400	.03⅝	.03¾	.03⅞	.04
64-66 390	.03⅞	.04	.04⅛	.04¼
64-66 375	.04	.04½	.04¼	.04½
64-66 360	.04½	.04⅝	.04½	.04⅝
†NORTH LOUISIANA—				
*U. S. Motor	.04¼		.04½	
60-62 400	.04½		.04¾	
†ARKANSAS—				
*U. S. Motor	.04½		.04¼	.04½
CHICAGO Based on Okla. (Group 3)—				
*U. S. Motor	.03⅝	.03⅞	.03⅝	.03⅞
60-62 400	.03¾	.04	.03¾	.04
64-66 375	.04½	.04⅝	.04½	.04¾
Aviation fighting grade	.05	.05½	.05	.05¼
68-70 360	.04⅝	.04¾	.04⅝	.04⅞

Octane Ratings—Above quotations cover price ranges on gasoline in which no octane rating is given. On October 4, in the case of the U. S. Motor and 60-62 400 endpoint grades, where an octane rating of 57-65, inclusive, is guaranteed, prices are three-eighths cent per gallon higher than quotations shown in above tables; where an octane rating of better than 65 is guaranteed, the prices are five-eighths cent higher. In the case of the remaining grades, gasolines of 65 octane rating or higher are quoted one-half cent higher than the quotations shown in above tables.

Unless otherwise provided by agreement of buyers and sellers, the Series 30 testing equipment of the Ethyl Gasoline Corp. is recognized as standard in determining octane ratings.

*Present distillation specifications on U. S. Motor gasoline are: 10 per cent evaporated, 167° F. maximum; 50 per cent, 284° F. maximum; 90 per cent, 392° F. maximum; residue not exceeding 2 per cent; maximum vapor pressure, 12 pounds. Additional specification on U. S. Motor gasoline available from bulletins of Bureau of Mines, Washington, D. C.

†For Arkansas, Louisiana and Mississippi delivery.

PENNSYLVANIA (inland refineries)—				
U. S. Motor	.06	.06¼	.06¼	.06½
60-62 400	.05⅝	.06	.06¼	.06½
64-66 375	.06¼	.06½	.06½	.06¾
68-70 350	.06½	.06¾	.06¾	.07

Octane Ratings—In the case of U. S. Motor and 60-62 400 endpoint grades, same price differentials based on octane ratings as shown in above tables for Oklahoma and other Mid-Continent areas:

CALIFORNIA (domestic movement only)—				
54-58 U. S. Motor	.05½	.06	.05¼	.05¾
58-60 400	.06	.06½	.06	.06¼
EAST COAST—				
U. S. Motor, below 65 octane:				
New York (Bayonne)	.05¼		.05¼	
Boston	.05¼		.06½	
Baltimore, Md.	.05¼		.05¼	
Charleston, S. C.	.05¼		.05¼	
U. S. Motor, 65 octane and above:				
New York (Bayonne)	*.05½	.06	*.05½	.06
Boston	.06		.07	
Baltimore, Md.	*.05½	.06	*.05½	.06
Charleston, S. C.	*.05½	.06	*.05½	.06
GULF COAST (domestic)—				
U. S. Motor, 65 octane and above	.05¼	.05½	.05¼	.05½
U. S. Motor, below 65 octane number	.04½	.05	.05	

*Contract price.

Naphthas

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
50-52 450 (blending)	.03¾	.04	.04	.04¼
PENNSYLVANIA (inland refineries)—				
50-54 430-450 (blending)	.05¾	.06	.06⅛	.06¼
ARKANSAS—				
48-50 450 (blending)	.04¾		.04¼	.04½
CHICAGO Based on Okla. (Group 3)—				
50-52 450 (blending)	.03½		.04¼	.04½
Cleaners' naphtha, 56-58 gr., 200 i.b.p.-320 e.p.	.05¾	.06	.05¾	.06
Lacquer diluent, 180 i.b.p.-250 e.p.	.07½	.07¾	.07½	.07¾
Lacquer diluent, 140 i.b.p.-200 e.p.	.08½	.09	.08½	.09
Rubber solvent, 68-70 gr., 100 i.b.p.-300 e.p.	.05½	.05¾	.05½	.05¾
Stoddard solvent, 300 i.b.p.-410 e.p. over 100° flash	.05¼	.05½	.05¼	.05½
Pet. thinner, 290, 300 i.b.p.-415 e.p., over 83° flash	.04½	.04¾	.04½	.04¾
V.M.&P. naphtha, 56-58 gr., 190-200 i.b.p.-330 e.p.	.05½	.05¾	.05½	.05¾
Petroleum spirits	.04	.05¼	.04	.05¼

Natural Gasolines

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
Grade 18-55	.03⅜	.03½	.03½	.03¾
Grade 26-70	.02⅞	.03	.03	
Grade 30-70	.02⅝	.02¾	.02¾	
*Low pressure grades:				
15 lb. v.p. (max.)	.03⅝	.03¾	.03¾	.03⅞
11 lb. v.p. (max.)	.04		.04	.04¼
NORTH TEXAS—				
Grade 18-55	.03⅜	.03½	.03½	.03⅝
Grade 26-70	.02⅞	.03	.03	
Grade 30-70	.02⅝		.02¾	
*Low vapor pressure grades:				
15 lb. v.p. (max.)	.03⅝	.03¾	.03¾	.03⅞
11 lb. v.p. (max.)	.04		.04	.04⅛
NORTH LOUISIANA—				
Grade 26-70	.03⅛		.03⅛	
CALIFORNIA—				
75-78 375	.04	.05	.04	.05

Note—Grades 18-55, 26-70 and 30-70 are three of 24 grades adopted by the Natural Gasoline Association of America effective January 1. The grades are based on pounds vapor pressure and amount evaporated at 140° F. While not exactly the same specifications apply, Grade 18-55 corresponds to the former Grade A, Grade 26-70 to former Grade AA and Grade 30-70 to former Grade BB.

*All low vapor pressure grades have minimum recovery of 96 (natural gasoline method.)

Kerosenes

(All kerosenes water white)

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
41-43	.03	.03⅛	.03	.03⅛
42-44	.03⅛	.03¼	.03⅛	.03¼
NORTH TEXAS—				
40-41	.02¾	.02⅞	.02¾	.02⅞
41-43	.02⅞	.03	.02⅞	.03
†NORTH LOUISIANA—				
41-43	.03¾		.03¾	
42-44	.04		.04	
†ARKANSAS—				
41-43	.03¾		.03¾	
PENNSYLVANIA (inland refineries)—				
45	.04⅝		.04⅝	
46	.04¾		.04¾	
47	.04¾	.05	.04¾	.05
CHICAGO (Based on Group 3)—				
41-43	.03	.03⅛	.03	.03⅛
42-44	.03⅛	.03¼	.03⅛	.03¼
*CALIFORNIA—				
38-40 high burning test	.04	.04¾	.04	.04¾
NEW YORK (Bayonne, N. J.)—				
41-43	.05½		.05½	.06
GULF COAST (domestic)—				
41-43 water white	.04¼	.04½	.04¼	.04½

*For Pacific Coast consumption.
†For Arkansas, Louisiana and Mississippi delivery.

Tractor Fuels*

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
39-40 prime white	.02⅞	.03	.02⅞	.03
38-40 light straw	.02¾	.02⅞	.02¾	.02⅞
NORTH TEXAS—				
38-40 light straw	.02⅝	.02¾	.02⅝	.02¾
CHICAGO (Based on Group 3)—				
38-40 light straw	.02⅞	.03⅛	.02⅞	.03
PENNSYLVANIA (inland refineries)—				
41-43 prime white	.04¼		.04¼	

*There are no standard specifications for tractor fuels. Grades commonly sold have flash under 175° F. (open cup) and under 575° F. endpoint and less than .2 per cent sulphur. Tractor fuels are available from all Mid-Continent refining groups at prices in line with the Oklahoma market taking into consideration differentials in freight rates.

Furnace Oils*

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
32-36 straw	.02⅝	.02¾	.02⅝	.02¾
36-38 straw	.02¾		.02¾	
38-40 straw	.02¾	.03	.02¾	.03
39-41 prime	.02¾	.03	.02¾	.03
NORTH TEXAS—				
38-40 straw	.02¾		.02¾	
†NORTH LOUISIANA—				
36-40	.03	.03⅛	.03	.03⅛
†ARKANSAS—				
32-36	.03		.03	
CHICAGO (Based on Group 3)—				
32-36 straw	.02⅝	.02¾	.02⅝	.02¾
38-40 straw	.02⅞	.03	.02⅞	.03
PENNSYLVANIA (inland refineries)—				
40-41 prime white	.03½		.03½	
NEW YORK (Bayonne, N. J.)—				
32-36	.04		.04	
36-40	.05		.05	
21 (industrial)	.03½		.03½	

*Above prices are for furnace oils of zero cold test under 190° F. flash and good odor.
†For Arkansas, Louisiana and Mississippi delivery.

Gas Oil, Diesel Oil and Fuel Oil

Gas oil (G.O.) quoted per gallon basis; Diesel oil and fuel oil per barrel.

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
32-36 (G.O.) cracking stock	.01¾	.01⅞	.01¾	.01⅞
U.G.I. (G.O.)	.01¾	.02	.01¾	.02
32-36 zero to 15 (G.O.) high flash	.02¼	.02⅜	.02¼	.02⅜
28-30, zero to 10	.77½	.80	.77½	.80
26-30, zero to 10	.70	.75	.70	.75
24-26	.50	.55	.50	.55
20-22	.47½	.50	.47½	.50
16-20	.42½	.47½	.42½	.47½
Below 16	.40	.42½	.40	.42½
NORTH TEXAS—				
32-36 (G.O.) industrial	.01⅝	.01¾	.01⅝	.01¾
22-26	.37½	.42½	.37½	.42½
Below 20	.35	.40	.35	.40
NORTH LOUISIANA—				
32-36 (G.O.) zero	.02½		.02½	
14-16	.35	.40	.35	.40
†ARKANSAS—				
32-36 (G.O.) zero high flash	.02½		.02½	
14-16	.35	.40	.35	.40
CHICAGO (Based on Group 3)—				
32-36 (G.O.) industrial	.01⅝	.01¾	.01⅝	.01¾
28-30 (zero)	.77½	.82½	.77½	.82½
22-26	.55	.60	.55	.60
18-22	.45	.50	.45	.50
Below 18	.30	.35	.30	.35
PENNSYLVANIA (inland refineries)—				
36-40	.03¼	.03½	.03¼	.03½

Note—Fuels oils of more than 40 cold test generally 5 to 10 cents per barrel less in all areas than shown in above tables.

†For Arkansas, Louisiana and Mississippi delivery.

CALIFORNIA—				
30-34 (G.O.) per bbl.	.75	.85	.70	.85
27 plus Diesel	.75	.85	.70	.85
15-19 bunker (at tidewater)	.55	.65	.55	.65
15-19 (cargo lots)	.50	.60	.50	.60
15-19 (tank car)	.40	.60	.40	.60
GULF COAST—				
28-30 (G.O.)	.03¼	.03⅜	.03¼	.03⅜
28-30 Diesel	1.50		1.50	
Bunker C (bulk cargoes)	.50	.52½	.55	.57½
Bunker C (bunkers)	.60		.60	
NEW YORK (Bayonne, N. J.)—				
28 plus (G.O.)	.04		.04	
*28-30 Diesel	1.65		1.65	
26-30 Diesel (tank cars)	.04		.04	
†Bunker C	.75		.75	

*Lighterage 6½ cents per barrel.
†Lighterage 5 cents per barrel.

Petroleum Coke*

Prices per ton f.o.b. refineries in Chicago area.

Breeze (screenings)	4.50	5.00	4.00	4.50
Still runs	4.75	5.00	4.25	4.50
Lump and egg	7.50		7.00	

*Refineries will absorb freight to 80 cents a ton.

Neutral Oils

(Viscosity at 100° F. and color)

	Oct. 4		Sept. 27	
OKLAHOMA (Group 3)—				
Zero to 10 Cold Test:				
150-3	.06¼	.06½	.06¼	.06½
180-3	.07½	.07¾	.07½	.07¾
180-4	.07	.07¼	.07	.07¼
200-3	.08¼	.08½	.08¼	.08½
200-4	.08	.08¼	.08	.08¼
204-3	.09¾	.10	.09¾	.10
240-4	.09½	.09½	.09½	.09½
280-3	.11¼	.11½	.11¼	.11½

280-4	.10¼	.10½	.10¼	.10½
300-3.5	.11¾	.12	.11¾	.12
350-3.5	.12¼	.12½	.12¼	.12½
400-4	.12¾	.13	.12¾	.13
500-4.5	.13¼	.13½	.13¼	.13½
100-2 paraffin oil	.04¼	.04½	.04¼	.04½
15-30 Cold Test:				
200-3	.07¾	.08	.07¾	.08
200-4	.07½	.07¾	.07½	.07¾
240-3	.09¼	.09½	.09¼	.09½
240-4	.08¾	.09	.08¾	.09
280-3	.10¾	.11	.10¾	.11
280-4	.09¾	.10	.09¾	.10
PENNSYLVANIA—				
150 vis., No. 3, 400-405:				
Zero pour test	.14	.15	.14½	.15½
10 pour test	.13	.14	.13½	.14½
15 pour test	.11½	.12	.12	.12½
25 pour test	.10		.10½	
30 pour test	.09¾		.10¼	
180 vis., No. 3, 25 pour test	.13	.14	.13½	.14½
200 vis., No. 3:				
Zero pour test	.20	.21	.20½	.22½
10 pour test	.19	.20	.19½	.20½
15 pour test	.17	.18	.17½	.18½
25 pour test	.15½	.16½	.16	.17
30 pour test	.15½	.16	.16	.16½
GULF COAST—				
Pale Oils:				
100-2-2½	.05		.05	
200-3	.06¼	.06½	.06¼	.06½
300-3	.06¾	.07	.06¾	.07
500-3½	.08	.08½	.08	.08½
750-3½	.09	.09½	.09	.09½
1,200-3½	.10½	.10¾	.10½	.10¾
2,000-4	.12	.12½	.12	.12½
Red Oils:				
200-5-6	.05	.05¼	.05	.05½
300-5-6	.05½	.05¾	.05½	.06
500-5-6	.06¾	.07	.06¾	.07
1,200-5-6	.09½	.10	.09½	.10
2,000-6 plus	.11	.11½	.11	.11½
CALIFORNIA—				
Pale Oils:				
100-2½-3	.07¾	.08	.07¾	.08
200-2½-3	.07¾	.08	.07¾	.08
300-3-3½	.08¼	.08½	.08¼	.08½
350-3-4	.08¾	.09	.08¾	.09
400-3-4	.09¼	.09¾	.09¼	.09¾
450-3-4	.09¾	.10	.09¾	.10
550-3-4	.10¼	.11	.10¼	.11
Red Oils:				
200-4½-5	.07	.07¼	.07	.07¼
300-5-6	.07½	.07¾	.07½	.07¾
350-5-6	.07¾	.08	.07¾	.08
400-5-6	.08	.08¼	.08	.08¼
450-5-6	.08¼	.08½	.08¼	.08½
500-5-6	.08½	.08¾	.08½	.08¾
600-5-6½	.08¾	.09	.08¾	.09
700-6½ plus	.09	.09¼	.09	.09¼
750-6½ plus	.09	.09½	.09	.09½
900-6½ plus	.12	.13½	.12	.13½

Bright and Steam Refined Stocks

OKLAHOMA (Group 3)—	Oct. 4		Sept. 27	
630 light green	.07¾	.08	.07¾	.08
600 light green S.R.	.05	.06	.05	.06
600 dark green S.R.	.04	.04½	.04	.04½
Bright Stocks:				
190-200 D	.18		.18	
150-160 D, 0-10	.17		.17	
150-160 D, 10-25	.16½		.16½	
150-160 D, 25-40	.16		.16	
150-160 E	.16		.16	
PENNSYLVANIA—				
600 S.R.	.12	.12½	.12	.12½
650 S.R.	.14	.15	.14	.15
600 Pennsylvania flash	.15¼	.16	.15¼	.16
630 D filtered	.20¼	.21	.20¼	.21
600 E filtered	.15¼	.15½	.15¼	.15½
Pennsylvania Grade bright stock:				
Bright Stock, No. 8 color, 145-50 vis. 210-540-550 flash:				
10 pour test	.25	.26	.26½	.27½
15 pour test	.23	.23½	.24½	.25
25 pour test	.20	.21	.20	.21
35 pour test	.19½	.20	.19½	.20

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—	Oct. 4		Sept. 27	
124-126 white crude scale	.01⅝	.01¾	.01⅝	.01¾
PENNSYLVANIA—				
122-124	.01⅞	.02	.01⅞	
124-126	.02		.02	
NEW YORK (Bayonne, N. J.)—				
Refined Wax:				
120-122	.02⅝		.02⅝	
125-127	.02⅞		.02⅞	

130-132	.03½		.03⅜	
133-135	.04⅛		.04⅛	
135-137	.04¼		.04¼	
Petrolatum in barrels in carload lots:				
Dark green	.01¾			
Amber	.02⅛		.02⅛	
Extra amber	.02½		.02½	
Cream	.04⅝		.04⅝	
Lily white	.05½		.05½	
Snow white	.06½		.06½	

Export Prices

GASOLINE

GULF COAST—	Oct. 4		Sept. 27	
U. S. Motor	.04¼	.04½	.04½	
60-62 400	.04¼	.04½	.04⅝	
61-63 390	.04⅜	.04½	.04⅝	
64-66 375	.04½	.04¾	.04¾	.05
LOS ANGELES, CALIF.—				
U. S. Motor, 53-55 437 e.p.	.03¾	.04¼	.03¾	.04¼
U. S. Motor, 65 octane num.	.05		.05	
U. S. Motor, 67 octane num.	.05¼		.05¼	
U. S. Motor, 69 octane num.	.05½		.05½	
58-60 400 endpoint gasoline.	.04¼	.05	.04¼	.05

KEROSENE

GULF COAST—				
41-43 prime white	.04⅜	.04½	.04⅜	
41 water white	.04½	.04¾	.04½	
LOS ANGELES, CALIF.—				
41-43 water white	.03¾	.04¼	.03¾	.04½
NEW YORK (f.a.s.) (in bbls.)—				
600 filtered	.23		.20½	.21
600 Warren E	.20½		.23	.23½
600 S.R. unfiltered	.20		.20	.21
650 S.R. unfiltered	.22½		.23	.24
600 flash S.R.	.23½		.24	.25
630 flash S.R.	.28½		.29	.30
Bright stock, No. 8 color	.27		.31	.33
Bright stock, No. 6½ color, dil.	.26½		.29	.31

NEUTRAL OILS

NEW YORK—Pale Engine Oil, Bulk (vis. at 100):				
230-33	.10	.10¼	.10	.10¼
180-31	.09½	.09¾	.09½	.09¾
100-2¼	.05½	.06	.05½	.06
Red Engine Oil, Bulk (vis. at 100):				
300-6½	.09½	.09¾	.09½	.09¾
250-6	.09	.09¼	.09	.09¼
200-6	.08¼	.08½	.08¼	.08½

Crude Oil Prices

Oklahoma, Kansas, North and East Central Texas

East Texas (Apr. 1, 1932)† ..... $ .98
East Texas (Apr. 11, 1932)‡ ..... .98
Corsicana heavy* ..... .64
Other fields ..... See gravity table

†Posted by Magnolia Petroleum Co., Sinclair Refining Co., Panola Pipe Line Co., Tidal Refining Co. and The Texas Company.
‡Gulf Pipe Line Co. and Atlas Pipe Line Co.
*Magnolia Petroleum Co.

Eastern States

JOSEPH SEEP PURCHASING AGENCY
(Effective October 3, 1932)

Pennsylvania Grade Oil in National Transit Lines (Bradford Field) $1.72
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.42
Penna Grade Oil in Eureka Pipe Line Lines 1.37
Penna Grade Oil in Buckeye Pipe Line Lines 1.22
Corning Grade Oil in Buckeye Pipe Line Co.'s line (Oct. 4, 1932) ..... .85
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (Jan. 16, 1931) ... .60

PENNZOIL CO.
(Effective September 13, 1932)

Pennsylvania Grade Oil in National Transit Lines:
Group A $1.67
Includes Cochran, Franklin, Hamilton and Doolittle districts.
Group B 1.66
Includes Titusville district.
Group C 1.65
Includes Turkey and Tidiout districts.
Group D 1.64
Includes Bear Creek and Porkey districts.
Group E 1.62
Includes Eldenau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Jameson, Kennerdell, Emlenton, Tiona, Lacy and Kinzua districts.
Price depends on length of pipe line haul to plant at Oil City.

TIDE WATER PIPE CO.
(Effective September 13, 1932)

Bradford, Pa. $1.72
Allegany, N. Y. 1.72

PURE OIL CO.
(Effective September 13, 1932)

Cabin Creek, W. Va. $1.37
Bradford Hollow, W. Va. 1.37
Kelly's Creek, W. Va. 1.37

Texas Panhandle

Gray County, Wheeler County and Carson-Hutchinson Counties....See gravity table

Rocky Mountain States

OHIO OIL CO.-MIDWEST REFINING CO.

Ilea, light (Aug. 24, 1931) ..... $ .75
Ilea, heavy (Aug. 24, 1931) ..... .53
Fort Collins (Apr. 11, 1932) ..... .86
Florence (Apr. 11, 1932) ..... .80
Wellington (Apr. 11, 1932) ..... .76
Greasewood Dome, Colo. (Apr. 11, 1932) 1.00
Dutton Creek (Apr. 11, 1932) ..... .82
Rock Creek, Wyo. (June 1, 1932) ..... .90
Frannie, light (Nov. 3, 1931) ..... .61
CRUDE OIL PRICES— .....

Frannie, heavy (Nov. 3, 1931) ..... .51
Salt Creek.....Mid-Continent gravity table
LaBarge .....Mid-Continent gravity scale
Big Muddy (Apr. 11, 1932) ..... .98
Grass Creek (June 1, 1932) 1.10
Elk Basin (June 1, 1932) 1.10
Lance Creek (Apr. 11, 1932) 1.15
Poison Spider (Mar. 5, 1931) ..... .70
Notches (Mar. 14, 1927) ..... .65
Hudson (June 2, 1931) ..... .65
Lander (Mar. 5, 1931) ..... .40
Rex Lake (Feb. 22, 1930) 1.10
Osage (Apr. 15, 1931) ..... .98
Lost Soldier (Apr. 12, 1932) ..... .80
Hamilton Dome (Nov. 3, 1931) ..... .45
Greybull (Apr. 11, 1932) 1.20
Cat Creek (Apr. 11, 1932) 1.20
Pondera (Nov. 3, 1931) ..... .90
Sunburst, Mont. (Apr. 11, 1932) 1.05
Hogback, N. Mex. (Aug. 24, 1931) ..... .80
Border, Mont. 1.55
Red Coulee, Alberta 1.55
Lea County, N. Mex. (Apr. 1, 1932)* ..... .65
Maljamar (Apr. 11, 1932) ..... .60
Artesia-Jackson (Apr. 11, 1932) ..... .65

Note—Salt Creek, Cat Creek, Dry Creek, Dallas-Derby, Hudson, Greybull, Hogback, and Ilea by Midwest Refining Co. and remainder by Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin. Lost Soldier posted by Producers & Refiners Corp. Artesia, Jackson and Maljamar posted by Continental Oil Co. Border and Red Coulee posted by Imperial Refining Co. Lea County posted by Humble Oil & Refining Co. Fort Collins, Wellington, Orchard, Florence, Rattlesnake and Table Mesa by Continental Oil Co. Osage posted by Arro Oil & Refining Co.
*Posted by The Texas Company. Humble Oil & Refining Co. met this price effective April 11.

West Texas

Iatan and Westbrook..Same as North Texas
Crane, Upton, Crockett, Howard, Glasscock, Mitchell, Ector, Winkler and Pecos Counties* ..... $ .65
Lea County, N. Mex. (See Rocky Mountain States.)
Toborg, Pecos County (Apr. 11, 1932)†.. .55

*Effective April 1, 1932, Magnolia Petroleum Co., The Texas Company. Effective April 11, Humble Oil & Refining Co. and Gulf Pipe Line Co. and Stanolind Oil & Gas Co. in Winkler County. †Shell Petroleum Corp.

Gulf Coast

Grade A and Grade B specifications discontinued by leading buyers ..... See gravity table
Jennings, La. (Apr. 11, 1932)* ..... $ .75
Lockport, La...See Gulf Coast gravity table
Refugio, light .....See gravity table
Refugio, heavy (Apr. 11, 1932)‡ ..... .80
Markham (Apr. 11, 1932)§ ..... See Gulf Coast gravity schedule
High Island (Apr. 11, 1932)¶ ..... See Gulf Coast gravity schedule

*Gulf Refining Co. †Magnolia Petroleum

(Continued on Next Page)

Crude Oil Gravity Table

	Kansas and Oklahoma	North and Central Texas	East Central Texas	Gray County, Texas	Carson and Hutchinson Counties, Texas	Salt Creek and LaBarge, Wyoming	North Louisiana and Arkansas	Gulf Coast (Texas-Louisiana)	Cameron, Meadows, Louisiana	Iowa and Lockport, Louisiana
	1	2	3	4	5	6	7	8	9	10
Below 25 degrees	....	....	$.67	....	....	....	$.68	$.80	$.70	$.80
25-25.9 degrees	....	....	.67	....	....	....	.70	.81	.71	.81
26-26.9 degrees	....	....	.67	....	....	....	.72	.82	.72	.82
27-27.9 degrees	....	....	.67	....	....	....	.74	.83	.73	.83
28-28.9 degrees	....	....	.76	....	....	....	.76	.84	.74	.84
Below 29 degrees	$.76	$.76	....	....	....	$.76	....	....	....	....
29-29.9 degrees	.78	.78	.78	....	....	.78	.78	.85	.75	.85
30-30.9 degrees	.80	.80	.80	....	....	.80	.80	.86	.76	.86
31-31.9 degrees	.82	.82	.82	....	....	.82	.82	.87	.77	.87
32-32.9 degrees	.84	.84	.84	....	....	.84	.84	.88	.78	.88
33-33.9 degrees	.86	.86	.86	....	....	.86	.86	.89	.79	.89
34-34.9 degrees	.88	.88	.88	$.76	$.66	.88	.88	.90	.80	.90
35-35.9 degrees	.90	.90	.90	.78	.68	.90	.90	.91	.81	.91
36-36.9 degrees	.92	.92	.92	.80	.70	.92	.92	.92	.82	.92
37-37.9 degrees	.94	.94	.94	.82	.72	.94	.94	.94	.84	.94
38-38.9 degrees	.96	.96	.96	.84	.74	.94	.96	.96	.86	.96
39-39.9 degrees	.98	.98	.98	.86	.76	.94	.98	.98	.88	.98
40 degrees and over.	1.00	1.00	1.00	.88	.78	.94	1.00	1.00	.90	1.00

Note—Magnolia Petroleum Co.'s prices in Oklahoma, North Texas and Central Texas, effective April 1, are the same as above given in Columns 1 and 2, excepting that the schedule begins with below 28 degrees, 67 cents; 28-28.9 degrees, 76 cents. The Empire Pipe Line Co. met the Magnolia prices in Kansas and Oklahoma; the White Eagle Oil Corp. in Kansas and the Pure Oil Co., in Oklahoma.

Column 1—Effective April 1, 1932, Continental Oil Co. in Oklahoma and Kansas; Barnsdall Refineries, Inc., and Standish Oil Co. (Phillips Petroleum Co.), in Oklahoma and Kansas; Skelly Oil Co., Kanotex Refining Co., Derby Oil Co., Vickers Petroleum Co., in Kansas; Magnolia Petroleum Co. and Pure Oil Co., in Oklahoma (see note above); White Eagle Oil Corp., in Kansas (see note above); The Texas Company in Oklahoma. Effective April 11, 1932, Stanolind Crude Oil Purchasing Co. in Oklahoma and Kansas; Gypsy Oil Co., Mid-Continent Petroleum Corp., Champlin Refining Co., Eason Oil Co., Pepper Gasoline Co. and Carter Oil Co. in Oklahoma. Carter Oil Co.'s schedule begins at below 25 degrees, 68 cents, with 2 cents added for each degree upward.

Column 2—Continental Oil Co., effective April 1, in North Texas only; followed on same day by The Texas Company in North and Central Texas; Magnolia Petroleum Co. in North and Central Texas (see note above); effective April 11, the Humble Oil & Refining Co., Gulf Pipe Line Co. and Stanolind Crude Oil Purchasing Co.

Column 3—Effective April 1, 1932, the Magnolia Petroleum Co., effective April 11, 1932. Humble Oil & Refining Co.

Column 4—Effective April 1, 1932, Magnolia Petroleum Co., effective April 2, the Philtex Oil Co. (Phillips Petroleum Co.), but its schedule was carried down to below 30 degrees at 66 cents, with 2 cents added for each degree upward. Effective April 11, other companies met Continental schedule.

Column 5—Effective April 1, 1932, Magnolia Petroleum Co., effective April 2, Philtex Oil Co., excepting that latter company carried its schedule down to below 30 degrees at 56 cents, with 2 cents added for each degree upward. Effective April 11, Continental Oil Co. and Gulf Pipe Line Co. met Magnolia Petroleum Co. prices.

Column 6—Midwest Refining Co., effective April 11, 1932.

Column 7—The Texas Company, effective April 1, 1932; Magnolia Petroleum Co., effective April 6, 1932; Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Stanolind Oil & Gas Co. (in Pine Island and Pleasant Hill and in Marion County, Texas) and Gulf Refining Co., effective April 11, 1932.

Column 8—The Texas Company, effective April 1, 1932; Sun Oil Co., April 1, 1932; Humble Oil & Refining Co., effective April 11, 1932; Gulf Pipe Line Co., effective April 11, 1932. Gulf's gravity scale ends with a top of 35 and above at 91 cents. Humble Oil & Refining Co., effective July 18, 1932, posted following prices for Conroe crude: 35-35.9 degrees, 90 cents; 36-36.9 degrees, 92 cents; 37-37.9 degrees, 94 cents; 38-38.9 degrees, 96 cents; 39-39.9 degrees, 98 cents; 40 and above, $1.

Column 9—Magnolia Petroleum Co., effective April 6, 1932.

Column 10—Magnolia Petroleum Co., effective April 6, 1932.

(California Crude Oil Prices on Page 30)

TANK WAGON MARKETS

Quotations for gasoline and kerosene in United States, as furnished by the larger marketing concerns, include taxes

October 4, 1932

TAXES

The gasoline quotations given in the following tables include the 1-cent Federal tax as well as state, county and city taxes. The gasoline quoted is the regular or standard grade. In most marketing areas a third or competitive grade is generally available at 1.5 or more cents per gallon under the service station price for the regular grade. Ethyl Gasolines are sold 3 cents above the service station price for the regular grade.

Standard Oil Co. (Indiana)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Chicago	15 1	15 1	4 0	10.0
Decatur, Ill.	17 6	15.6	4 0	10 1
E. St. Louis	16 9	16 9	4 0	9.3
Joliet	17.6	15.6	4.0	8.6
Peoria	17.6	15 6	4 0	10.1
Quincy	17 4	15 0	4 0	9 9
Davenport, Ia.	17.7	17.7	4 0	10 4
Des Moines	17.7	15 9	4 0	8.0
Keokuk	17.7	17 7	4 0	10.4
Sioux City	17.3	17 3	4 0	10.0
Duluth, Minn.	18 7	18.7	4 0	11 0
Mankato	18.3	18.3	4.0	8 1
Minneapolis	18 4	15.4	4.0	11 0
LaCrosse, Wis.	19 4	19 4	5 0	11.1
Milwaukee	17 3	17.3	5 0	10.0
Madison	18.5	18.5	5 0	10.2
Detroit, Mich.	12 6	12.5	4 0	9.9
Grand Rapids	14.5	14.5	4 0	10.3
Saginaw	16.6	15 6	4.0	10 6
Evansville, Ind.	18.2	18.2	5 0	†13.9
Indianapolis	18 4	18.4	5 0	†14.1
South Bend	16 7	16.7	5 0	†14 4
Fargo, N. D.	20 1	20.1	4.0	12 0
Huron, S. D.	19.5	19.5	5.0	11 8
Sioux Falls	19.0	19 0	5 0	10 0
K. C., Mo.*	15 1	15.1	4.0	8 7
Springfield*	17.0	17.0	4.0	8 c
St. Louis*	14 6	11 0	4.0	7 5
St. Joseph*	16.7	15 0	4 0	7 5
Wichita, Kans.	15 9	14 0	4 0	7.0
Bartlesville, Ok.	15.5	18.0	5.0	8.0

*State tax 2 cents, 1-cent city tax and 1-cent Federal tax.

†Includes 4-cent tax. Buyers of kerosene not used as motor fuel can secure refund of tax.

Effective November 4—New dump discount applicable on all grades of gasoline sold from tank wagon. Any tank wagon customer buying 25 gallons or more at one time will be given 1-cent discount per gallon off tank wagon price at time of delivery. Customers not under contract receive no other discount.

Effective January 1—Discounts on Q.D.A. on 500 gallons or more per month throughout territory; Red Crown Ethyl Gasoline, 3 cents off tank wagon price; Red Crown gasoline, 2½ cents off tank wagon price; Stanolind Blue gasoline, 1 cent off tank wagon price. On deliveries of 75,000 gallons or more each classification allowed 1 cent additional discount.

Discounts on resellers authorised agent's agreement: Same amounts as above except made off service station price instead of tank wagon price.

Stanolind Furnace Oil in Chicago

Effective July 1, 1932, prices f.o.b. Chicago, tank wagon prices: No. 1 (36-40 lt. stw. sero), 100 gallons or more, 6 cents; No. 2 (30-34 stw. sero), 150 gallons or more, 5.50 cents, No. 3 (22-26 sero), 200 gallons or more 4.75 cents; No. 4 (12-16 sero), 400 gallons or more, 4 cents. Viscosity of No. 4, 90-115 at 100° F.

Fuel Oils

Chicago Oil Heat Institute Prices

Spot market prices on 350 gallons or over deliveries, and top prices on contracts, respectively: 38-40, 6½ cents and 8 cents; 32-36, 6 cents and 7½ cents; 28-30, 5¼ cents and 6¾ cents; 24-26, 4½ cents and 5½ cents; 18-22, 4¼ cents and 5¼ cents. On deliveries of less than 350 gallons the spot price is one-half cent higher.

Southwestern District

MAGNOLIA PETROLEUM CO.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Dallas, Tex.	13.5	15 0	5.0	7.0
Fort Worth	13 5	15 0	5.0	9 0
Houston	13 5	16 0	5.0	8.0
San Antonio	13.5	16 0	5.0	9 0
El Paso	15.0	17 0	5 0	11 0
Texarkana	*16 0	16 0	5.0	†11 0
Muskogee, Ok.	11.5	14 0	5 0	8 0
Okla. City	12 5	15.0	5.0	8.0
Tulsa	10 5	13.0	5 0	8 0
Ft. Smith, Ark.	*14 5	*14 5	7.0	†9 0
Little Rock	*16 5	*16.5	7.0	†9.0

*Less 2½ cents to dealers. †Less 2 cents to dealers.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.	21 0	21 0	7.0	11 0
Augusta	17 5	17 5	7 0	11.0
Macon	21 0	21.0	7 0	13.0
Savannah	19 0	19 0	7 0	12.5
Birm'ham, Ala.	18.0	18 0	7.0	11.0
Mobile	18 0	18 0	7.0	8.0
Montgomery	21 0	21 0	7 0	13.5
Jackson, Miss.	18.0	18 0	7 0	10.0
Vicksburg	18 5	18.5	7 0	10 5
Jack'ville, Fla.	15.0	15.0	8 0	10 0
Miami	16 0	16 0	8 0	12.5
Pensacola	19.0	19.0	8 0	12 5
Tampa	18.0	18 0	8 0	12.0
Lexington, Ky.	17 5	17 5	6.0	10.5
Covington	18 0	18.0	6.0	10 5
Louisville	17.0	17 0	6.0	10.5
Paducah	18.0	18 0	6.0	8.0

A third grade "Kyso Green" is sold at a price generally 2 cents below the price on the regular grade.

In addition to the state tax of 4 cents on gasoline, Montgomery has city and county tax of 3 cents on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fortieth cent on gasoline. To Pensacola, Montgomery and Birmingham state taxes add 1-cent tax. To Mobile state tax add 1-cent city tax. Dealers receive discount of 3 cents off tank wagon price throughout territory.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Denver, Colo.	16 0	19 0	5.0	12 5
Pueblo	16.0	19 0	5 0	12.5
Grand Jctn.	20 0	23.0	5 0	14 5
Casper, Wyo.	17.0	20.0	5.0	10 0
Cheyenne	18 0	21 0	5.0	11 5
Butte, Mont.	20 0	23.0	6 0	17 0
Billings	23 0	26 0	6 0	16.5
Great Falls	23.0	26 0	6 0	17.0
Helena	22 0	25.0	6 0	17.0
Salt Lake, Utah	18 0	21 0	5 0	16.0
Albu'que, N. M.	16 0	19 0	*7.0	14.0
Boise, Idaho	22 5	25.5	6.0	18.0
Twin Falls	22.5	25.5	6.0	18.0

*One-cent city tax.

Central South District

STANDARD OIL CO. (LOUISIANA)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
N. Orleans, La.	17 5	17 5	*7.0	†11 0
Baton Rouge	16.0	16.0	6 0	†10 0
Alexandria	17 5	17 5	*7 0	†10.0
Lafayette	17 5	17.5	*7.0	†10.0
Lake Charles	17 5	17 5	*7.0	†10.0
Shreveport	15 5	15.5	6 0	†10.0
Knoxville, Tenn.	20.0	20.0	8 0	11 5
Memphis	15.0	15 0	8 0	9.0
Chattanooga	20.5	20 5	8 0	11 5
Nashville	19.5	19 5	8 0	11 0
Bristol	19 0	19.0	8.0	12.0
Lt. Rock, Ark.	17 5	17.5	7.0	9.0

*Includes city tax of 1 cent. †Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

Two-cent discount off kerosene tank wagon price and 2½ cents off gasoline tank wagon price to dealer and commercial accounts.

Ohio

STANDARD OIL CO. (OHIO)*

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Ohio points	16.5	17.0	5.0	†12.0

*Two cents off on gasoline tank wagon to dealers and commercial accounts; 2½ cents off tank wagon on kerosene to dealers.

Nebraska

STANDARD OIL CO. (NEBRASKA)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Omaha	16.9	17.9	5 0	10 25
McCook	19.0	19.0	5 0	11 75
Norfolk	18 75	18 75	5 0	10.75
N. Platte	19.0	19.0	5 0	11 5
Scottsbluff	19 0	19.0	5.0	11.25

Note—Dealers' discount allowed as follows: Red Crown Ethyl, 3 cents off station price; Red Crown, 2½ cents off normal service station price; Nebraska Blue (third grade), 1 cent off normal service station price.

New York and Part of New England District

STANDARD OIL CO. (NEW YORK)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Albany, N. Y.	14.5	15 5	4 0	9 0
New York	15 0	15.0	4 0	9.5
Buffalo	15 5	16.5	4.0	9 0
Rochester	15.5	16 5	4 0	9 0
Syracuse	15.5	16.5	4 0	9.5
Boston, Mass.	14.0	15 0	4.0	8.9
Augusta, Me.	17 0	18 0	4 0	9 0
Manch'tr, N. H.	17 0	18.0	5 0	8.0
Burlington, Vt.	16.5	17.5	5.0	8.5

Pennsylvania-Delaware and Part of New England

ATLANTIC REFINING CO.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Pittsburgh, Pa.	15 5	16.5	4 0	10 0
Philadelphia	15 0	16 0	4 0	10.0
Scranton	15 5	16.5	4 0	10.0
Allentown	15.5	16.5	4 0	10 0
Altoona	15.5	16 5	4.0	10 0
Erie	15 5	16.5	4 0	10.0
Dover, Del.	15 5	16 5	4.0	10.0
Wilmington	15 5	16 5	4.0	10.0
Springf'd, Mass.	15 0	16.0	4 0	8.0
Worcester	15.0	16 0	4.0	8 0
Boston	14 0	15 0	4.0	8 0
Providence, R.I.	13.0	14.0	3.0	8.0
Hartford, Conn.	14 0	15 0	3 0	8 0
New Haven	14 0	15.0	3.0	8.0

Atlantic Coast District

STANDARD OIL CO. (NEW JERSEY)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atl'tic City, N.J.	14.7	15.7	4 0	11.2
Newark	14 0	15.0	4 0	8 5
Annapolis, Md.	15.3	16.3	5.0	10 0
Baltimore	14 7	15 7	5 0	7 0
Cumberland	16.2	17 2	5 0	11.7
Wash'g'n, D. C.	13 2	14.2	3 0	10.9
Danville, Va.	17.4	18.4	6 0	11 9
Norfolk	15 8	16 8	6.0	10 3
Petersburg	16 9	17.9	6.0	11.4
Richmond	16 2	17.2	6 0	10 7
Roanoke	17 4	18.4	6.0	11 9
Charles'n, W.Va.	16.1	17 1	5 0	11 6
Parkersburg	14 7	15 7	5 0	10.2
Wheeling	15 7	16.7	5.0	11 2
Charlotte, N. C.	19 0	20 0	7 0	12.5
Hickory	19.2	20 2	7 0	12 7
Mt. Airy	19.3	20.3	7.0	12 8
Raleigh	20.0	20.0	7 0	12 3
Salisbury	19 1	20 1	7 8	12 6
Charleston, S.C	16 8	17 8	7.0	10 3
Columbia	18.7	19.7	7 0	12 2
Spartanburg	19.0	20.0	7.0	12.5

Two cents per gallon discount off tank wagon price of gasoline to dealers except Washington, D. C., and States of Maryland and New Jersey, where discount is 3 cents. Kerosene 1 cent off tank wagon for 25 gallons or more under contract except New Jersey.

Naphtha

	Tank: Wagon	Tank: Car
Oleum spirits	10.7	6.23
V.M.P. naphtha	12 7	7 23
Cleaners' naphtha	15.2	9.23
Stanisol	15.2	9.23

Tank wagon prices f.o.b. Chicago January 6, 1932. Each of above prices subject to discount of 1 cent per gallon for 150-gallon lots if covered by contracts.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA*

	Gasoline: Tank truck†	Gasoline: Posted retail	Gasoline: Incl'ds tax of	Kero. tank wagon
Fresno	19.5	18.5	4 0	17 0
San Francisco	19.0	18 0	4.0	15 5
Los Angeles	18.5	17.5	4 0	15 5
Reno, Nev.	23 0	22.0	5 0	19 0
Portland, Ore.	21.0	20.0	5 0	16.5
Seattle, Wash.	22 0	21.0	6 0	16 5
Tacoma	22.0	21 0	6 0	16 5
Spokane	25.5	24 5	6.0	20 5
Phoenix, Ariz.	19.5	21.5	6 0	20 5

*Retail prices posted by Standard Stations, Inc., a subsidiary.

†Above prices are at company's plant or depots as company does not operate stations. A 4-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 1 cent.

TANK WAGON CHANGES

Standard Oil Co. of Indiana reduced the gasoline station price to 15.6 cents in Decatur on September 20 and on the same date reduced the station price to 14.5 cents in Grand Rapids, Mich. On September 24 the tank wagon price was also reduced to 14.5 cents in Grand Rapids. On the same date the station price was reduced to 16.7 cents in South Bend and to 11 cents in St. Louis. On September 26 the station price was reduced to 15.6 cents in Peoria. On September 27 the station price was reduced to 15 cents in Quincy and to 15.6 cents in Joliet. On September 14 the station price was reduced to 12.5 cents in Detroit.

Standard Oil Co. of New York reduced the gasoline tank wagon and station prices 1 cent throughout the greater share of its territory on September 28.

Continental Oil Co. reduced the gasoline tank wagon and station price 2 cents to 16 and 19 cents in Albuquerque, N. M., on September 23.

Standard Oil Co. of Louisiana reduced

(Continued on Page 30)

Crude Oil Prices

(Continued from Preceding Page)

Co. ‡Humble Oil & Refining Co. §The Texas Company. ¶Yount Lee Pipe Line Co.

North Louisiana and Arkansas

Smackover, Ark. (all grades)	$ .65
Urania, La. (Apr. 12, 1932)	.60
East El Dorado, Ark. (Apr. 6, 1932)	.65
Stephens, Ark., below 29° (Apr. 12, 1932)	.61
Stephens, Ark., 29° and above (Apr. 12, 1932)	.64
Other fields	See gravity table

Note—Smackover, all grades, The Texas Company, April 1, 1932; Magnolia Petroleum Co., April 6, 1932; Standard Oil Co. of Louisiana, Gulf Refining Co. and Louisiana Oil Refining Co., April 11, 1932. Urania posted by H. L. Hunt, Inc., and Louisiana Oil Refining Co.; East El Dorado by Magnolia Petroleum Co.; effective April 6, 1932; by Gulf Refining Co., effective April 11, 1932; Stephens, Ark., by Louisiana Oil Refining Co. and Atlantic Oil Producing Co.

South Central and Southwest Texas

Darst Creek (Apr. 1, 1932)*	$ .75
Luling (Apr. 1, 1932)*	.64
Mirando (Apr. 1, 1932)*	.96
Pettus (Apr. 11, 1932)‡	1.00
Salt Flat (Apr. 11, 1932)‡	.75
Thrall§	
Lytton Springs (Lockhart) (Apr. 1, 1932)*	.84
Dobrowolski¶	
Same as Mid-Continent gravity scale up to and including 38-38.9°	
Somerset¶	
Same as Mid-Continent gravity scale up to and including 38-38.9°	

*Magnolia Petroleum Co., The Texas Company, Humble Oil & Refining Co. posted 80 cents for Mirando, April 11. ¶Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ¶Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products. ‖Pioneer Oil & Refining Co. ‡Humble Oil & Refining Co.

Middle Western States

OHIO OIL CO.

(Effective April 11, 1932)

Lima	$1.15
Wooster	1.35
Illinois	1.10
Indiana	.75
Princeton	1.10
Plymouth	Shut in
Western Kentucky	1.05
Midland, Mich. (July 13, 1932)*	.85
Muskegon (July 14, 1932)†	Mid-Continent gravity scale
Muskegon (June 30, 1932)‡	.98
Somerset, Ky. (Apr. 25, 1932)	.85
Hart County, Ky. (June 10, 1932)§	1.00

*Posted by Pure Oil Co. Old Dutch Refining Co. pays 20 cents per barrel over Pure Oil Co.'s posted price. †Naph-Sal Refining Co. ‡Old Dutch Refining Co. §Posted by Stoll Refining Co. Somerset, Ky., crude purchased by Ashland Refining Co., Ashland, Ky., and delivered through own pipe line.

Mexico

Panuco*	$0.44

*F.o.b. ship, based on July transactions and exclusive of production and export taxes and bar dues.

Canada

Ontario (Nov. 3, 1931):	
Petrolia*	$1.90
Oil Springs*	1.97
Alberta (Apr. 22, 1932):	
Turner Valley†:	
Crude oil 40-44.9	1.54
Crude oil 45-45.9	2.13
Crude oil 50 and above	2.80
Crude naphtha	3.32
Discolored naphtha	3.08

*Imperial Oil, Ltd. †Imperial Oil, Ltd., and Regal Oil & Refining Co.

NEWS FOR SALES DEPARTMENTS

Richfield to Spend Large Sum in Its Marketing Branch

NEW YORK, Oct. 1.—William C. McDuffie, receiver for Richfield Oil Co. of California, has notified creditors of a special hearing to be held October 10 in Los Angeles on the budget of necessary capital expenditures for the period October 1, 1932, to April 1, 1933.

The budget for the marketing division of $264.634 provides money needed for the following purposes: To provide additional storage tanks for gasoline, thereby producing reduced transportation costs; to provide adequate loading rack facilities for faster and metered truck loading; to provide new trucking equipment and for the remodeling of present trucking equipment thereby replacing obsolete equipment and reducing operating costs; to provide underground storage tanks at advantageous points allowing proper distribution and truck and trailer deliveries; to provide for the replacement of worn out and leaking pipe lines; to provide for the installation of gasoline measuring meters at remote bulk plants to check unauthorized withdrawals and help correct stock losses.

Government Awards Number of Refined Oil Contracts

A number of government oil contracts were reported awarded by various bureaus recently as follows:

Petroleum Products Co., St. Louis, 15,000 bbls. of fuel oil, 39 cents per barrel, 1 per cent, f.o.b. tank cars point of shipment, for delivery to the U. S. Engineer at St. Louis.

Sun Oil Co., 4,000 gallons of annealing oil, 4 cents per gallon, 1 per cent delivery to Frankford Arsenal, Pa.

Pan American Petroleum & Transport Corp., 8,000 gallons of gasoline, 11.5 cents per gallon, delivery to U. S. Engineer at New Orleans.

Gulf Refining Co., 60,000 gallons of gasoline, 9 cents per gallon, 2 per cent delivery to U. S. Engineer at New Orleans.

Gulf Refining Co., 8,500 gallons of gasoline, 1 cent under service station price, and 300 gallons of lub oil, 20 cents per quart, delivery to Department of Agriculture, Washington, D. C.

Standard Oil Co. of New Jersey, following gasoline orders for delivery to Army Quartermaster, Brooklyn, N. Y., 1,100 gallons at 18.1 cents; 1,100 gallons at 17.6 cents; 1,100 gallons at 17.6 cents; 1,100 gallons at 16 cents; 1,100 gallons at 18 cents; 1,100 gallons at 17.6 cents, and 1,400 gallons at 16.4 cents.

Atlantic Refining Co., 35,000 gallons of gasoline, 7.82 cents per gallon, delivery to Army Quartermaster, Brooklyn.

Standard Oil Co. of Pennsylvania, 1,000 gallons of gasoline at 10¾ cents, delivery to Army Quartermaster, Brooklyn.

Sinclair Refining Co., 7,000 gallons of gasoline at 7.02 cents, and 2,000 pounds of grease at 5½ cents, delivery to Army Quartermaster at Brooklyn.

Richfield Oil Co., 2,000 gallons of gasoline at 10 cents, delivery to Army Quartermaster, Brooklyn.

Standard Oil Co. of New York, 10,000 gallons of gasoline at 7½ cents and 1,000 gallons at 13.9 cents, delivery to Army Quartermaster, Brooklyn.

Sinclair Refining Co., 10.000 pounds cup grease in barrels, $1,585; 24,000 pounds gear and wire lubricants, in half barrels, $1,645, 1 per cent; delivery to U. S. Engineer at Vicksburg, Miss.

Low Schedules of Motor Car Production Accounts for Drop in Gasoline Sales

By CHARLES E. KERN
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Oct. 1.—Data collected by the Automotive Division of the Department of Commerce show clearly the reason for the decline in domestic gasoline consumption so far this year when compared with the same period in 1931 and 1930. The government reports for August show there has been no upturn in the trend toward decreased production of practically all types of motor vehicles. Production of these new motor vehicles for over a year has not kept pace with those taken out of service and junked so there are constantly less units on the roads to consume gasoline and motor oils.

The production of passenger cars for August was 93,457, which made a total of 861,270 for the first eight months of this year. This compares with the first eight months of previous years as follows: 1931, 1,527,186; 1930, 2,111,608; 1929, 2,964,758. Only 15,081 commercial cars were produced in August which makes a total of 130,378 for the first eight months of this year. For the corresponding periods of previous years the production was as follows: 1931, 234,445; 1930, 301,575; 1929, 373,388.

The following table gives the production of passenger cars and commercial cars by months, starting January 1, 1925:

PRODUCTION OF PASSENGER CARS IN UNITED STATES

	1925	1926	1927	1928	1929	1930	1931	1932
January	158,884	197,819	175,273	136,971	219,694	180,094	126,786	87,493
February	151,200	167,107	180,396	165,537	235,201	211,645	134,133	82,813
March	240,411	280,902	261,111	254,214	378,200	298,824	200,831	92,192
April	335,740	396,222	331,396	332,056	481,750	357,064	265,732	121,093
May	325,345	403,036	318,479	351,459	453,981	345,031	247,727	131,282
June	296,357	327,126	266,291	317,069	386,441	260,861	201,911	148,752
July	309,575	334,469	251,699	324,120	432,609	254,098	194,322	104,188
August	253,504	308,495	245,115	329,674	376,852	203,737	155,744	93,457
September	188,013	261,798	185,975	271,821	304,359	175,286	124,903	.....
October	238,483	241,569	186,127	284,939	288,782	150,219	102,659	.....
November	186,116	161,733	132,487	211,736	183,616	93,066	75,829	.....
December	149,061	145,145	89,189	160,883	138,732	96,054	77,564	.....
Total	2,832,689	3,227,421	2,623,538	3,139,579	3,880,247	2,625,979	1,908,141	.....

NEW COMMERCIAL CAR SALES IN THE UNITED STATES

	1925	1926	1927	1928	1929	1930	1931	1932
January	21,310	26,736	27,569	16,431	29,914	30,202	24,414	14,776
February	19,973	23,194	28,438	17,510	32,652	31,846	23,475	14,558
March	27,784	34,944	33,482	24,698	46,238	42,172	30,609	16,876
April	33,963	44,298	37,071	30,272	56,258	46,978	36,851	17,784
May	31,835	36,761	33,966	32,468	52,838	43,253	33,489	18,696
June	27,709	33,245	28,505	29,154	45,079	33,496	28,490	17,876
July	33,033	38,191	28,359	31,844	57,893	39,876	30,085	14,731
August	34,247	36,653	27,856	36,753	52,516	33,752	27,032	15,081
September	30,186	34,326	24,436	35,135	46,532	33,911	25,967	.....
October	32,109	35,136	27,231	40,890	49,870	34,205	24,695	.....
November	21,705	23,667	18,824	27,491	33,593	21,994	15,546	.....
December	19,296	18,117	12,088	18,476	23,242	18,642	13,147	.....
Total	333,150	385,268	327,825	341,122	526,625	410,327	313,800	.....

British Gas Prices Increased as Market Combine Expands

NEW YORK, Oct. 4.—All grades of motor fuel, including benzol and benzol blends, have been advanced by major marketers in the United Kingdom by 3d. per gallon, according to reports from England.

The increase was coincident with the action of Petroleum Storage & Finance Corp., Ltd., marketers of "Cleveland" motor spirits, in joining the group of "national companies" which largely dominate the British market.

Trinidad Leaseholds, Ltd., and Russian Oil Products, Ltd., the two major marketing groups not in the combine, have advanced their prices 3d. per gallon in line with the increase made by the combine.

RE-ELECT JAMES DUCE

PHILADELPHIA, Pa., Oct. 1.—James Duce, state oil inspector of Colorado, was elected president of the North American Gasoline Tax Conference at the closing session of the seventh annual meeting of the group at the Bellevue-Stratford Hotel. This will be Mr. Duce's third term in office. A. P. Delahunt, commissioner of liquid fuel tax in Pennsylvania, was chosen vice president, E. D. Gordon of Ohio, secretary, and J. C. Colton, Illinois, treasurer. Next year's meeting will be held at Indianapolis, Ind.

Larger California Marketers Show General Sales Increase

While most of the larger marketing companies increased the volume of motor fuel sold in California during August compared to July, the Standard Oil Co., the largest marketer in the State, showed a slight decrease. The volume of motor fuel sold by the nine largest marketers, arranged in their order of August sales, appears below:

SALES OF MOTOR FUEL IN GALLONS

Company—	1932 July	1932 August
Standard Oil Co. ...	25,778,308.1	24,631,912.1
Shell Oil Co.	14,820,533.0	15,772,753.0
Union Oil Co.	10,376,572.8	12,879,241.0
Associated Oil Co. ..	9,972,418.0	12,665,600.0
Richfield Oil Co. of Calif.	9,238,779.0	9,750,773.7
General Pet. Corp. of Calif.	5,405,468.0	6,348,112.0
The Texas Company	4,712,869.0	5,262,097.0
Wilshire Oil Co., Inc.	3,254,997.2	3,782,870.7
Caminol Co., Ltd. ..	1,287,301.8	2,699,052.4

SULLIVAN HEADS CHEMISTS

F. W. Sullivan, consulting and research chemist of Whiting, Ind., has been elected chairman of the petroleum chemistry division of the American Chemical Society. Other officers are as follows: Vice chairman, Prof. G. G. Brown, University of Michigan; secretary, C. R. Wagner, chief chemist, Pure Oil Co., Chicago. Executive committee: J. C. Morrell, Universal Oil Products Co., Oak Park, Ill.; R. T. Haslam, Standard Oil Development Co., New York City.

Relation Between Imports-Exports Better in August

WASHINGTON, D. C., Oct. 1.—The decrease in imports of petroleum and products during August, compared with the same month of 1931, was much greater than the decrease in exports in the same period.

Exports of petroleum and products declined in value from $22,744,160 in August, 1931, to $17,404,949 in August of this year.

Imports of petroleum and products during the same period declined in value from $6,829,205 to $2,081,660.

Crude petroleum free of duty imported in August, 1931, totaled 2,701,512 bbls., valued at $1,748,340, declining to 1,862,436 bbls. dutiable, valued at $1,110,291, in August of this year.

Advanced and refined oils free of duty imported in August, 1931, totaled 3,215,762 bbls., valued at $4,973,140, compared with 1,564,591 bbls., valued at $915,561, dutiable in August, 1932.

Imported fuel oil, including topped petroleum, in August, 1931, totaled 1,957,659 bbls., valued at $1,351,043, free of duty, declining to 1,450,689 bbls. dutiable, valued at $716,474, in August, 1932.

Unfinished distillates totaling 8,695 bbls., valued at $53,963, free of duty, in August, 1931, compares with 1,716 bbls., valued at $15,579, dutiable, in August of this year.

Finished light products totaling 1,244,164 bbls., valued at $3,499,536, were imported free of duty in August, 1931, declining to only 110,868 bbls., valued at $172,206, imported dutiable in August, 1932.

Illuminating oil imported in August.

(Continued on Page 60)

FORM NEW GERMAN CARTEL

According to reports from Berlin a new gasoline cartel has been organized covering German distribution with all groups represented except Sinclair interests. The latter has less than 2 per cent of the gasoline sales in Germany. The former cartel was dropped some time ago due to the low price competition of Russia and Rumania.

Under the new cartel Standard Oil of New Jersey has the largest share, 21 per cent, followed by Shell with 20 per cent. German Benzol Syndicate with 18 per cent and the Soviet sales organization with 16.5 per cent.

Prices probably will be advanced. The average price of 33 pfg. a liter was increased by 3 pfg. September 1 and may be increased further. The f.o.b. Hamburg price is 6 pfg., but customs duties and taxes amount to 19 pfg., bringing the total to 25 pfg. The difference between 25 and 33 pfg. is declared insufficient to cover indirect costs.

AMERICAN OIL MOVES OFFICES

On October 1, the American Oil & Grease Corp. moved their general sales offices from the Book Building, Detroit, Mich., to Chicago, Ill., consolidating with their general offices at 201 N. Wells Street.

The Swan-Finch Oil Corp., which controls the American Oil & Grease Corp., has transferred its sales in the West to the American Oil & Grease Corp. under the supervision of A. J. (Andy) Callaghan.

NEW DISTRIBUTING PLANT

CHATHAM, Ontario, Oct. 1.—Imperial Oil. Ltd., is building a storage and distributing plant at Fernie, British Columbia, at a cost of $14,000.

NEWS FOR PETROLEUM REFINERS

Danciger Adds to Refining Facilities in Panhandle Area

The Red Ball Refining Co., a Texas corporation controlled by the Danciger brothers, will immediately start constructing a 2,500-bbl. combination unit near the site of the Petroleum Refractionating Corp.'s plant in Pampa, Tex. The Danciger brothers also hold a controlling interest in the latter plant. The new company has been capitalized at $20,000. Construction work is expected to be completed in January.

The Petroleum Refractionating Corp.'s refinery has a capacity at present of 6,500 bbls. The company also owns a new 10,000-bbl. topping plant located at Longview in the East Texas area. The latter plant has not operated.

Mid-West Employes Receive Bonus Following Dissolution

DENVER, Colo., Oct. 3.—Midwest Refining Co. will adjust salaries over a term of years for several officials who will be retained by the Standard Oil Co. (Indiana) and the Stanolind Oil & Gas Co. following the dissolution and a formula for taking care of employes released has been announced. Altogether, approximately $200,000 will be distributed. A statement issued by the company is as follows:

"As many employes as possible will be taken care of, either by the Standard Oil Co. (Indiana) or the Stanolind Oil & Gas Co., but there will be many for whom employment cannot be found. In order to provide for those employes who will be released, the following formula has been adopted to be used in computing additional compensation:

"1. Male employes under 45 and female employes under 35, regardless of length of service, will receive one-half month's salary plus one week's salary for each year of service.

"2. Male employes 45 and over and female employes 35 and over, having 10 years' service or more, will receive one-half month's salary plus two weeks' salary for each year of service.

"3. Male employes 45 and over and female employes 35 and over, having less than 10 years of service, will receive one-half month's salary plus one week's salary for each year of service."

Charles E. Arnott Explains Compact With Rumanians

NEW YORK, Oct. 3.—Charles E. Arnott, president of the Standard-Vacuum Co., returned from conferences in Paris with Rumanian oil companies on control of the foreign market, said the international oil companies and the Rumanian group reached an agreement satisfactory to all, the details of which were highly technical.

The agreement, he said, would stabilize the foreign market and have "a strong tendency" to enhance markets in Europe in fields other than the oil business. He added:

"The compact, which affects only foreign markets, allows the Rumanians to keep their present quotas of foreign trade. They will have to curtail their export of crude oil a little because of a falling off in consumption.

"We met earlier in the summer and arrived at a tentative agreement, which was ratified by the Rumanians and the international oil companies, but when gathered again in September a few difficulties that had arisen had to be ironed out. These were all arranged."

Higher Railroad Rates to Northern Points Emphasize Mid-Continent Position

The competition between railroads, gasoline pipe lines and water movement was again emphasized last week when increased rail rates from the Mid-Continent to northwestern Minnesota and North Dakota became effective. The rail rates from the Mid-Continent to the northern destination points were reduced last spring, but on September 22 the carriers were authorized to return to the rates previously in effect. Since last spring their rail rates on the short hauls from the gasoline pipe line terminal at Minneapolis and also the water terminals located at Duluth, Minn., and Superior, Wis. Thus the disadvantage of the Mid-Continent refiners is increased.

Effective March 15, the carriers, in purported compliance with the decision and order of the Interstate Commerce Commission in the case of the International Oil Co. et al vs. Abilene & Southern Ry. Co. et al, 179 I.C.C.435, published reductions in the rates on Petroleum from the Mid-Continent Field to points in Minnesota located north and west of the line of the Great Northern Railway, running from Duluth through Willmar to Pipestone, Minn., and also points in North Dakota, running as high as 2 cents per gallon but generally ranging between one-half cent per 100 pounds, or .03 cent per gallon, to 13½ cents per 100 pounds, or .891 cent per gallon.

Due to the large decrease in revenues which the reduction caused, made more acute by the general economic conditions, the carriers filed numerous petitions with the Interstate Commerce Commission requesting the case to be reopened on account of the changed economic conditions, all of which were denied by the commission. Subsequently, the carriers then filed a bill in equity in the District Court of the United States for the district of Minnesota seeking an injunction against the commission enforcing the reduced rates. Late in July the court granted the carriers a permanent injunction against the order of the commission causing the reduced rates. The carriers have now published to become effective September 22 the same rates, with minor exceptions, which were in effect from the Mid-Continent Field prior to the reduction of March 15 this year. The following table shows the recent changes in rail rates on refined oils:

	From Group 3			From Duluth		From St. Paul, Minneapolis	
To Minnesota—	Mar. 14	Mar. 15	Sept. 22	July 29	July 30	July 29	July 30
Alexandria	.04026	.03564	.04026	.02079	.01848	.01584	.01584
Brainerd	.04059	.0362	.04059	.01419	.01386	.01551	.01551
Bemidji	.04488	.04026	.04488	.01914	.01782	.02277	.02046
Crookston	.04686	.04224	.04686	.02343	.02310	.02277	.02277
Fergus Falls	.04092	.03696	.04092	.02079	.01914	.01914	.01848.
Hallock	.05214	.04752	.05214	.02508	.02508	.02574	.02574
Thief River Falls	.0495	.04356	.0495	.02343	.02343	.02442	.02442
To North Dakota—							
Bismarck	.05478	.04686	.05478	.03729	.03564	.03729	.03498
Devils Lake	.0495	.04686	.0495	.03498	.02838	.03498	.0297
Fargo	.04158	.03828	.04158	.02343	.02046	.0231	.02046
Grand Forks	.04686	.04224	.04686	.02607	.02376	.02574	.02508
Jamestown	.05082	.04224	.05082	.03168	.0297	.03036	.02904
Minot	.05412	.05016	.05412	.04389	.03564	.04389	.03564
New Rockford	.05082	.04488	.05082	.03498	.03036	.03498	.0297

ARREST PIPE LINE THIEF

KANSAS CITY, Mo., Oct. 1.—An arrest was made this week charging a local truck operator with tapping the gasoline pipe line of the Great Lakes Pipe Line Co. The line connects several Oklahoma and one Kansas refinery to the larger consuming points as far north as Chicago and Minneapolis.

According to Sheriff Becker, the truck operator has confessed that he tapped the line five nights. He told officials that he made three trips nightly and sold the gasoline through bootleg channels. The theft was detected by checks on pipe line pressure.

MERTZON REFINERY OPERATING

FORT WORTH, Tex., Oct. 1.—The Mertzon Refining Co. has completed its 200-bbl. capacity topping plant on the Santa Fe Railroad west of Mertzon, Tex., and will operate on crude from the high gravity, sweet oil producing shallow pool a short distance to the south. It is now seeking a market for fuel oil, having obtained a market for its gasoline. W. H. Stowell of Breckenridge and associates constructed the plant.

GLADEWATER FIRE

Fire swept the Gladewater Refining Co.'s plant at Gladewater, Tex., on the night of September 29 causing a loss of around $50,000. Twenty-six oil tanks exploded. Water was played on the V. O. E. Refining Co.'s tanks to the south to prevent them from igniting. The plant will be rebuilt immediately.

ORGANIZE REFINERS SALES

Z. S. Biglane and W. E. Robinette have opened the Refiners Sales office in the Ward Building in Shreveport. The firm will handle Mid-Continent products. Mr. Biglane has been a marketer of petroleum for the past 10 years, both as an independent and with one of the major companies. Mr. Robinette has been an accountant in the department of petroleum for one of the major refiners and distributors in North Louisiana for the past 15 years.

TAKE WILCOX OIL

The Wilcox Oil & Gas Co. is laying 6 miles of 4-inch line from its storage at Pampa to The Texas Company's tank farm at Kings Mill, where The Texas Company will take over the crude and transport it in its line to the Taxman Refining Co.'s refinery at Wichita Falls. The Wilcox Oil & Gas Co. has agreed to sell approximately 4,000 bbls. per day to the refining company. The Texas Pipe Line Co. will get 12½ cents per barrel carrying charge.

ARKANSAS REFINERS PROTEST

The South Arkansas group of refiners this week are protesting the proposal of Arkansas refiners to advance rail rates on intrastate shipments. The proposed increases involve both crude oil and refinery products. The increases, it is stated, in some cases, are as much as 33⅓ per cent. The changes have been under consideration for 18 months.

Standard of Indiana Trying to Hold All Men on Pay Roll

CHICAGO, Oct. 4.—"Although Standard Oil Co. of Indiana has not adopted a uniform five-day week program because of many complexities in its manufacturing, a policy of dividing work to keep men employed at all its refineries is in effect," President E. G. Seubert told 200 representatives of employes attending the company's fourteenth industrial relations conference last night.

Layoffs of more than 1,000 men have been prevented following completion of construction work and reduction of manufacturing operations. "Eighteen months ago we determined that we would no longer discharge men in our refineries if we could possibly find any way of keeping them employed."

Mr. Seubert also pointed out that the man who is reasonably sure of his job even if only on half time is a positive factor in bringing about recovery while the man without a job is a negative factor. "The season's construction work is now largely completed so that without further opportunities for making work and with no increase in refining operations in sight, we have turned to a general distribution of work in other divisions to alleviate unemployment," President Seubert said.

Plan to Build 1,000-Barrel Refinery Near Bolivar, N. Y.

NEW YORK, Oct. 4.—Capitalized at $500,000, the Allegany Refineries, Inc., have been incorporated to construct a 1,000-bbl. refinery at Bolivar, N. Y.

The new company was organized by producers in the Allegany Field of New York and is headed by A. L. Shaner of Bolivar. The company has taken over the gathering lines of the Bradford Transit Co., and will erect a skimming plant immediately.

Ethyl Price Differential of 3 Cents Remains Unchanged

NEW YORK, Oct. 3.—Rumors in circulation in some parts of the country dealing with a reduction in the differential between the price for regular grades of gasoline and Ethyl Gasoline to 2 cents per gallon have no basis in fact, according to headquarters of the Ethyl Gasoline Corp. here.

The contracts between Ethyl Gasoline Corp. and its licensees specify a minimum differential and thus far there have been no efforts made by refinery-licensees to secure any revision in the differential agreement.

MAY BUILD REFINERY

Construction of a new refinery at Baca, N. Mex., to handle crude from the Seven Lakes, Hospah Dome and Walker Dome districts is under consideration by the Transport Refining Co. The company has completed a pipe line survey from Hospah Dome Pool to Prewitt.

PACKER WITH ASSOCIATION

C. E. Packer, at one time copywriter with Williams & Cunnyngham, and before that, technical editor of Automobile Trade Journal and Motor Age, is now publicity director of the Pennsylvania Grade Crude Oil Association.

NEW EAST TEXAS PLANT

R. O. and I. N. Anderson are building a 250-bbl. refinery at Trent, Tex., which will be known as the Tren-Tex Refining Co. It will process crude from the Swann wells west of the Noodle Creek Pool, Jones County.

NATURAL GASOLINE MANUFACTURE

Stocks of Natural Gasoline Slightly Lower in California

California natural gasoline production in August was practically unchanged, amounting to 33,769 bbls. as compared with 33,431 bbls. during July, according to the Pacific Coast Division of the Bureau of Mines. Refinery utilization decreased from 25,703 bbls. to 23,723 bbls. daily but this decrease was offset by shipments which amounted to 5,603 bbls. daily as against 192 bbls. daily the previous month. Stocks at the end of the month amounted to 2,872,055 bbls., a total decrease of 1,247 bbls.

CALIFORNIA NATURAL GASOLINE STATISTICS FOR JULY AND AUGUST

(Daily average in barrels)

	Aug.	July
Total production	34,133	33,821
Stock trans. (deliv.) receipt—net	(777)	(334)
Total	33,356	33,487
Deduct refinery requirements:		
Run to stills	3,693	3,489
Blended	20,030	22,214
Gains (losses) unaccounted for—net	(3,608)	(3,506)
Net supply available to market	6,025	4,278
Demand		
Domestic consumption	372	395
Offshore shipments:		
Pacific foreign exports	1,590	192
Atlantic foreign exports	4,103	...
Total market demand	6,065	587
Surplus or (deficit)	(40)	3,691
Stocks—Last Day of Period		
Total stocks	2,872,055	2,873,302
Inside Pac. Coast territory at refineries	2,378,225	2,322,763
Elsewhere	493,830	550,539
Inside Pac. Coast territory—last day	2,872,055	2,873,302
Inside Pac. Coast territory—first day	2,873,302	2,758,880
Increase or (decrease) during the period	(1,247)	114,422

OPERATING DATA

	Aug.	July
No. of plants operating	106	108
Daily capacity in M.C.F.	2,520,251	2,598,251

PRODUCTION BY FIELDS

	Gas treated (thousand cu. ft.)	Natural gasoline produced (gallons)
Fullerton and Whittier	546,537	1,365,783
Midway	1,806,901	3,097,660
Huntington Beach	421,887	1,412,284
Kettleman Hills	7,549,530	10,642,064
Long Beach	3,610,730	8,444,615
Richfield	380,601	472,598
Santa Fe Springs	5,241,401	8,113,355
Seal Beach	547,307	961,582
Ventura Avenue	2,712,146	2,933,192
All other fields	4,067,836	6,523,649
Total	26,884,876	43,966,782

PRODUCTION BY METHODS—AUGUST

Type of plant—	Gas treated M.C.F.	Natural gasoline produced (gals.)	Gasoline recovery per M.C.F. gas treated
Oil absorption	26,699,265	43,768,205	1.639
Compressor	185,611	198,577	1.070
Total	26,884,876	43,966,782	1.635

Bbls.

Finished gasoline produced at plants 182

STOCKS OF NATURAL GASOLINE

	Barrels—Aug. 1	Barrels—Sept. 1
Natural gasoline held by plant operators	53,439	63,541
Natural gasoline held by refineries	2,818,616	2,809,761
Total	2,872,055	2,873,302

LIQUEFIED PETROLEUM GASES

(Barrels)

	Aug.	July
Production	365	390
Sales	372	373

Manufacture of Natural Gasoline and Carbon Black More Dependent

The operation of natural gasoline plants and that of carbon black plants is shifting yearly, bringing the two into a more dependent position, especially in those areas where there is difficulty in disposing of the residue gas from the gasoline plants. A complete summary of carbon black plant operations during 1931 is included in a recent report on that industry made by G. R. Hopkins and H. Backus of the Bureau of Mines. The report states:

"The unsatisfactory economic conditions experienced by the carbon black industry in 1931 were reflected in material declines in the number of operators and in the number of plants. The number of operators declined to 26 and the number of plants to 58. These data represent the smallest number of operators and plants since just before the rapid expansion of the industry in 1923; however, they fail to measure completely the extent of the curtailment in operations in 1931, as there were 9 plants that operated part of the year and then closed, but are included in the total of 58. The 9 plants closed in 1931 included 4 in Louisiana, 3 in Texas, and 1 each in Montana and Utah. The plants that closed in Montana and Utah were the only active ones in those states, indicating further concentration of the industry in Texas in 1932.

"The total daily capacity of the plants operated during 1931 amounted to 1,366,975 pounds, compared with 1,481,175 pounds for those operated during 1930. This undoubtedly represents the first time in recent years in which a decline in operating capacity has been recorded. The average daily output of carbon black during the closing days of 1931 probably did not exceed 700,000 pounds, from which the deduction can be made that the plants were then operating at about 50 per cent of their capacity."

The average value of carbon black at the plants in 1931 was 3.07 cents per pound, the lowest recorded and a decline of 0.84 cent per pound from the average value in 1930. The greater part of the domestic consignments of carbon black in 1931 sold for 3 cents per pound, the price established by practically all the major companies in February. Shipments of Carbon black to rubber manufacturers accelerated following a decline of half a cent in the posted price in both January and February, so that in April they were reported to have exceeded the production for the first time in many months. This increase in demand made the carbon black producers optimistic of higher prices, but reduced sales of tires in the latter half of the year and the top-heavy stocks of carbon black prevented this hope from being realized. As a matter of fact, prices showed a tendency to weaken late in the year, and considerable so-called distress product was sold for less than 3 cents per pound. However, nearly all the new contracts covering the requirements for 1932 were based on a 3-cent price.

The total value at the plants of the carbon black produced in 1931 amounted to $8,621,000, compared with $14,852,000 in 1930 and with the peak value of $18,720,000 in 1929.

CARBON BLACK PRODUCERS OF THE UNITED STATES AS OF JANUARY 1, 1932

State and company—	County	Nearest town	Process
LOUISIANA:			
Century Carbon Co., 365 East Illinois Street, Chicago, Ill.	Ouachita Richland	Swartz Archibald	Channel Channel
J. Smylie Herkness, Route No. 2, Bastrop, La.	Morehouse	Bastrop	Channel
J. M. Huber Co. of Louisiana, Inc., 460 West Thirty-fourth Street, New York, N. Y.	Ouachita	Swartz	Channel
Imperial Oil & Gas Products Co., 1104 Union Bank Bldg., Pittsburgh, Pa.	Ouachita	Sterlington	Channel
Peerless Carbon Black Co., 3003 Grant Bldg., Pittsburgh, Pa.	Ouachita	Bourland	"Special"
Peerless Carbon Black Co., 3003 Grant Bldg., Pittsburgh, Pa.	Ouachita	Guthrie	"Special"
Southern Carbon Co., 45 East Forty-second Street, New York, N. Y.	Morehouse	Perryville	Channel
Southern Carbon Co., 45 East Forty-second Street, New York, N. Y.	Morehouse	Spyker	Channel
Southern Carbon Co., 45 East Forty-second Street, New York, N. Y.	Ouachita	Fairbanks	Channel
Southern Carbon Co., 45 East Forty-second Street, New York, N. Y.	Ouachita	Fowler	Channel
Southern Carbon Co., 45 East Forty-second Street, New York, N. Y.	Ouachita	Swartz	Channel
Texas-Louisiana Producing & Carbon Co., P. O. Box 181, Monroe, La.	Ouachita	Not reported	Channel
Thermatomic Carbon Co., 230 Park Ave., New York, N. Y.	Ouachita	Sterlington	Thermatomic
United Carbon Co., P. O. Box 1475, Charleston, W. Va.	Morehouse	Bastrop	Channel
United Carbon Co., P. O. Box 1475, Charleston, W. Va.	Ouachita	Cargas	Channel
United Carbon Co., P. O. Box 1475, Charleston, W. Va.	Ouachita	Phillips	Channel
United Carbon Co., P. O. Box 1475, Charleston, W. Va.	Ouachita	Swartz	Channel
United Gas Public Service Co., Monroe, La.	Morehouse	Bastrop	Channel
OKLAHOMA:			
Oklahoma Carbon Industries, Inc., Sayre, Okla.	Beckham	Sayre	Channel
TEXAS:			
Cabot Carbon Co., 940 Old South Bldg., Boston, Mass.	Gray	Pampa	Channel
Cabot Carbon Co., 940 Old South Bldg., Boston, Mass.	Hutchinson	Stinnett	Channel
Cabot Carbon Co., 940 Old South Bldg., Boston, Mass.	Carson	Skellytown	Channel and roller
Coltexo Corp., 45 East Forty-second Street, New York, N. Y.	Gray	Lefors	Channel
Coltexo Corpx., 45 East Forty-second Street, New York, N. Y.	Stephens	Parks	Channel
Crescent Carbon Co., Point Pleasant, W. Va.	Hutchinson	Borger	Channel
Eastern Carbon Black Co. (United Carbon Co., owner), P. O. Box 1475, Charleston, W. Va.	Hutchinson	Borger, 2 plants	Channel
Eastern Carbon Black Co. (United Carbon Co., owner), P. O. Box 1475, Charleston, W. Va.	Hutchinson	Borger	Channel and disk
General Atlas Chemical Co., 60 Wall Street, New York, N. Y.	Gray	Pampa	"Special"
J. M. Huber Co. of Louisiana, Inc., 460 West Thirty-fourth Street, New York, N. Y.	Hutchinson	Borger	Channel
Kosmos Carbon Co. (United Carbon Co., owner), P. O. Box 1475, Charleston, W. Va.	Hutchinson	Borger	Channel
Magnolia Petroleum Co., Dallas, Tex.	Gray	Pampa	Channel
Magnolia Petroleum Co., Dallas, Tex.	Wheeler	Lela	Channel
Palmer Carbon Co., 80 East Jackson Boulevard, Chicago, Ill.	Hutchinson	Borger	Channel
Panhandle Carbon Co., Slattery Bldg., Shreveport, La.	Hutchinson	Borger	Channel
Peerless Carbon Black Co., 3003 Grant Bldg., Pittsburgh, Pa.	Eastland	Pioneer	"Special"
Peerless Carbon Black Co., 3003 Grant Bldg., Pittsburgh, Pa.	Gray	Pampa	"Special"
Texas Carbon Industries, Inc., P. O. Box 55, Breckenridge, Tex.	Stephens	Breckenridge, 2 plants	Channel
Texas Elf Carbon Co., 940 Old South Bldg., Boston, Mass.	Gray	Pampa	Channel
Texas Elf Carbon Co., 940 Old South Bldg., Boston, Mass.	Stephens	Eliasville	Channel
Western Carbon Co., 45 East Forty-second Street, New York, N. Y.	Gray	Kings Mill	Channel
Western Carbon Co., 45 East Forty-second Street, New York, N. Y.	Gray	Lefors	Channel
Western Carbon Co., 45 East Forty-second Street, New York, N. Y.	Gray	Pampa	Channel
Western Carbon Co., 45 East Forty-second Street, New York, N. Y.	Hutchinson	Borger	Channel
Western Carbon Co., 45 East Forty-second Street, New York, N. Y.	Wheeler	Lela	Channel
Western Carbon Co., 45 East Forty-second Street, New York, N. Y.	Wheeler	Magic City	Channel
WYOMING:			
J. M. Huber Co. of Louisiana, Inc., 460 West Thirty-fourth Street, New York, N. Y.	Niobrara	Manville	Channel

OPERATE PANHANDLE PLANT

The Magnolia Petroleum Co. has secured permit from the Railroad Commission to operate its carbon black plant to use residue gas from one of its casinghead gasoline plants in Wheeler County. The latter plant is being supplied with gas from a well of the company in this county. The plants will handle about 4,000,000 feet of gas daily.

PANHANDLE CASE DELAYED

The next hearing before the three-judge Federal court regarding the authority of the Texas Railroad Commission to shut in the Panhandle gas field will be held in San Antonio October 31. The hearing is the result of the injunction which the Cities Service and Texoma Natural Gas Co. obtained keeping the commission from enforcing its original order.

Sales Department Is Moved Back to Tulsa

The sales department of the Oil Well Supply Co., which some time ago was moved to Dallas from Tulsa, has been returned to Tulsa. E. E. (Ned) Robbins, manager of sales for East Texas, Dallas, Kansas and Oklahoma, who has been located at the general offices of the company in Dallas, is now located again in Tulsa and all sales in the territory covered by him will be handled out of Tulsa. M. W. Phelps, formerly manager of sales of manufactured goods for the company, is now manager of sales for the Gulf Coast and Louisiana, with headquarters in Houston, Tex.

OUSTER SUIT HEARING

AUSTIN, Tex., Oct. 3.—The American Petroleum Institute's case for the code of ethics will be told at Austin, beginning October 13, in the ouster suit hearing. W. R. Boyd, executive vice president, and Paul E. Hadlick, secretary of the general committee on distribution and marketing, are to be called as the next witnesses before George E. Shelley, special commissioner.

The actual trial before District Judge J. D. Moore is expected to be started in January, although there is a possibility it might be reached earlier.

CRUDE OIL PRICE CHANGES

The South Penn Oil Co., Tide Water Pipe Co. and other purchasers reduced the price of Pennsylvania grade oil produced in New York, Pennsylvania, West Virginia and southeastern Ohio 15 cents per barrel, effective October 3, and the South Penn Oil Co. reduced the price of Corning, Ohio, crude 20 cents per barrel, effective October 4.

Mid-Continent Section of A. S. M. E. Holds Two Days' Meeting in Tulsa

By L. G. E. BIGNELL
Petroleum Engineering Editor

The Mid-Continent Section of the American Society of Mechanical Engineers held a two days' session in the Hotel Alvin, Tulsa, October 4 and 5, at which time several papers dealing with metallurgy as applied to the petroleum industry were presented. John M. McGregor, engineer, Taubman Supply Co., Tulsa, was chairman of the meeting and introduced H. F. Brindel, chairman of the Mid-Continent Section.

The first paper was one prepared by E. W. P. Smith, Lincoln Electric Co., Cleveland, Ohio, and delivered by W. B. Whentoff. The paper was entitled "Welding, the Industrial Process," and dealt with the development of the art of welding from uses for repairs only to its many applications at this time in fabricating materials and manufacturing equipment used in the petroleum industry.

The meeting was then adjourned to the plant of the Leland Equipment Co., Tulsa, where C. K. Stipp, engineer for Metallizing Corp. of America, Los Angeles, Calif., presented a paper on "Prevention of Corrosion and Erosion by Coating of Metal on Metal." This covers a new process that has been developed by the Metallizing Corp. of America, and in addition to describing the process, Mr. Stipp made several demonstrations of the method used in applying metal coatings to various objects.

The afternoon session was devoted to two papers, the first, "Selection of Materials for High Pressure, High Temperature Work," by V. T. Malcolm, metallurgical engineer, Chapman Valve Manufacturing Co., Indian Orchard, Mass., and the second, "Valve and Fitting Materials for High Temperature, High Pressure Service," by H. W. Maack and J. J. Canter, Crane Co., Chicago, Ill.

Wednesday morning's session was devoted to papers by F. C. Hutchinson, Linde Air Products Co., "Metallurgical Aspect of a New Oxyacetylene Welding Method," and F. B. Applegate and R. J. Allen, Worthington Pump & Machinery Corp., Harrison, N. J., "Materials for Pump and Compressing Equipment in the Oil Industry."

In the afternoon, E. C. Wright, chief metallurgist, United States Steel Corp., representing National Tube Co., Illinois Steel Co. and the American Sheet & Tin Plate Co., Pittsburgh, Pa., delivered a paper on "Ferrous Metals Used in Oil Industry," and John E. Getzen, chief engineer and metallurgist, Stockham Pipe & Fitting Co., "Metallurgical and Engineering Factors Affecting Return Bend Design."

The meetings were attended by about 75 members and guests of the A.S.M.E. and each paper developed considerable discussion.

Don Hinderliter Goes to Colombia, South America

Don R. Hinderliter, of Tulsa, sailed from New York September 17 for Berranca Bermeja, Colombia, South America, where he will serve in the engineering department of the Tropical Oil Co. He was scheduled to arrive at his destination Oc-

DON R. HINDERLITER

tober 1. Mr. Hinderliter graduated in 1929 from the University of Wisconsin, where he specialized in geology and metallurgy. Following his graduation Mr. Hinderliter was in charge of the heat treating plant of the Hinderliter Tool Co., Tulsa.

TANK WAGON CHANGES

(Continued from Page 26)

the gasoline tank wagon and station prices to 15 cents in Memphis on September 24. On the same date these prices were reduced to 19 cents in Bristol. On September 26 these prices were reduced one-half cent in Nashville and Chattanooga, Tenn. On October 1 these prices were reduced one-half cent in Baton Rouge, La.

Atlantic Refining Co. reduced the gasoline tank wagon price to 14.7 and the station price to 15.7 cents in Baltimore, Md. on September 23. On the same date these prices were reduced to 14.3 and 15.3 cents in Annapolis, Md. On the same date these prices were reduced to 16.2 and 17.2 cents, respectively, in Richmond, Va., and to 16.9 and 17.9 in Wilmington, N. C. On September 26 the gasoline tank wagon and station prices were reduced 1 cent generally throughout Pennsylvania and Delaware. On September 28 these prices were further reduced to 15 and 16 cents in Springfield and Worcester, Mass., and to 14 and 15 cents in Hartford and New Haven, Conn.

Standard Oil Co. of Kentucky reduced the gasoline tank wagon and station prices to 18½ cents in Vicksburg on September 24. On September 26 these prices were reduced to 18 cents in Tampa, to 16 cents in Jacksonville and to 19 cents in Pensacola. On September 27 these prices were reduced to 15 cents in Jacksonville. On September 28 these prices were reduced to 18 cents in Covington, to 17.5 cents in Lexington and to 18 cents in Paducah. On the same date these prices were reduced to 21 cents in Atlanta, and to 19 cents in Savannah. On September 29 these prices were reduced to 17½ cents in Augusta.

Magnolia Petroleum Co. reduced the gasoline tank wagon and station prices to 12½ and 15 cents in Dallas September 21. On September 24 these were reduced to 12½ and 15 cents in Oklahoma City and to 10½ and 13 cents in Tulsa. On the same date these were reduced to 14½ cents each in Fort Smith and to 16½ cents each in Little Rock, Ark.

California Crude Oil Prices

STANDARD OIL CO. OF CALIFORNIA
(Effective June 26, 1932)

For current purchases of crude oil at the well (unless otherwise specified.) (All gravities above those quoted take highest price offered in that field.)

Gravity—	Signal Hill (Long Beach)	Seal Beach, Alamitos Heights, Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Torrance	Richfield	Coyote Hills	Santa Fe Springs	Midway-Sunset, Elk Hills, Buena Vista Hills	Lost Hills	Athens, Rosecrans, Domingues	Montebello	Wheeler Ridge	Coalinga	Whittier-LaHabra
14-14.9	$.65	$.65	$.65	$.65	$.65	$.65	$.65	$.65	....	$.55	$.55	....	$.65	$.55	$.55	$.65
15-15.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55	....	.65	.55	.55	.65
16-16.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55	....	.65	.55	.55	.65
17-17.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55	....	.65	.55	.55	.65
18-18.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55	....	.65	.55	.55	.65
19-19.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55	....	.65	.55	.55	.65
20-20.9	.69	.69	.71	.69	.69	.69	.69	.65	....	.59	.59	....	.65	.57	.59	.68
21-21.9	.74	.74	.77	.74	.74	.74	.74	.66	....	.63	.63	....	.67	.60	.62	.72
22-22.9	.79	.79	.82	.78	.79	.79	.79	.70	....	.69	.69	....	.70	.63	.65	.77
23-23.9	.84	.84	.88	.82	.84	.84	.84	.76	....	.75	.75	....	.73	.66	.68	.83
24-24.9	.89	.89	.92	.86	.89	.89	.89	.81	$.73	.81	.81	$.89	.76	.69	.72	.89
25-25.9	.93	.93	....	.91	.93	.93	.93	.86	.79	.87	.87	.93	.80	.72	.75	....
26-26.9	.97	.97	....	.96	.97	....	....	.90	.84	.92	.91	.97	....	....	....	....
27-27.9	1.00	....	....	....	1.00	....	....	.94	.89	.97	.94	1.00	....	....	....	....
28-28.9	1.03	....	....	....	1.03	....	....	.98	.94	1.02	.99	1.03	....	....	....	....
29-29.9	1.06	....	....	....	....	....	....	1.02	.98	1.07	1.02	1.06	....	....	....	....
30-30.9	1.09	....	....	....	....	....	....	1.05	1.02	1.12	1.05	1.09	....	....	....	....
31-31.9	....	....	....	....	....	....	....	....	1.06	....	....	1.12	....	....	....	....
32-32.9	....	....	....	....	....	....	....	....	1.10	....	....	1.15	....	....	....	....
33-33.9	....	....	....	....	....	....	....	....	1.14	....	....	....	....	....	....	....
34-34.9	....	....	....	....	....	....	....	....	1.18	....	....	....	....	....	....	....
35-35.9	....	....	....	....	....	....	....	....	1.22	....	....	....	....	....	....	....
36-36.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

The Texas Company, effective June 26, posted same prices as the Standard Oil Co. in Signal Hill, Alamitos Heights, Huntington Beach, Torrance, Richfield, Montebello, North Whittier and Santa Fe Springs.

The Union Oil Co., effective June 26, posted the same price as the Standard Oil Co. in the Signal Hill, Alamitos Heights, Seal Beach, Huntington Beach, Athens, Rosecrans, Dominguez, Torrance Santa Fe Springs, Playa Del Rey, Coyote, Olinda, Brea Canyon, Richfield and Montebello. In Coalinga, Lost Hills, Kern River, McKittrick, Midway-Sunset, Elk Hills and Buena Vista Hills the Union Oil Co. met the Standard Oil Co.'s prices from 14 gravity upward, but posted a price of 50 cents for oil 11 to 13.9 degrees in gravity.

General Petroleum adopted Standard Oil Co.'s prices, effective June 26, in Rosecrans, Signal Hill, Alamitos Heights, Santa Fe Springs, Inglewood, Torrance, Brea Canyon and Olinda, up to 25.9 degrees; Richfield, Midway-Sunet, Kern River, Mount Poso, Round Mountain, and Coalinga and posted in Rincon as follows: 22-22.9 degrees, 68 cents; 23-23.9 degrees, 73 cents; 24-24.9 degrees, 78 cents; 25-25.9 degrees, 82 cents; 26-26.9 degrees, 86 cents; 27-27.9 degrees, 89 cents; 28-28.9 degrees, 92 cents; 29-29.9 degrees, 95 cents; 30 degrees and over, 98 cents. In Rosecrans, General Petroleum Co. pays 65 cents for 14 to 19.9 gravity oil; 20-20.9 degrees, 69 cents; 21-21.9 degrees, 74 cents; 22-22.9 degrees, 79 cents; 23-23.9 degrees, 85 cents, and Standard's prices for oil of higher gravity.

Associated Oil Co., effective June 26, met Standard Oil Co.'s prices in Signal Hill, Huntington Beach, Seal Beach, Alamitos Heights, Richfield, Torrance, Inglewood, Athens, Rosecrans, Domingues, Santa Fe Springs, McKittrick, Kern River, Midway-Sunset, Elk Hills, Buena Vista Hills, Lost Hills, Belridge and Coalinga.

Kettleman Hills—The Union Oil Co., effective June 26, posted 33-33.9 gravity oil at 91 cents; 34-34.9 degrees, 93 cents; 35-35.9 degrees, 95 cents; 36-36.9 degrees, 97 cents; 37-37.9 degrees, 99 cents; 38-38.9 degrees, $1.01; 39 degrees and over, $1.03. Standard Oil Co., Associated Oil Co. and General Petroleum Co. adopted same price schedule on same day.

Santa Paula—The Union Oil Co. and The Texas Company, effective June 26, posted as follows: 14 degrees to 19-19.9 degrees, 66 cents; 20-20.9 degrees, 69 cents; 21-21.9 degrees, 72 cents; 22-22.9 degrees, 75 cents; 23-23.9 degrees, 78 cents; 24-24.9 degrees, 81 cents; 25-25.9 degrees, 84 cents; 26-26.9 degrees, 87 cents; 27-27.9 degrees, 90 cents; 28-28.9 degrees, 93 cents; 29 degrees and above, 99 cents.

Shields Canyon and South Mountain—The Texas Company, effective June 26, posted same prices as in Santa Paula.

Orcutt—The Union Oil Co., effective June 26, posted prices as follows: 16 degrees to 19.9 degrees, 55 cents; 20-20.9 degrees, 59 cents; 21-21.9 degrees, 63 cents; 22-22.9 degrees, 69 cents; 23-23.9 degrees, 75 cents; 24-24.9 degrees, 81 cents; 25-25.9 degrees, 87 cents; 26 degrees and above, 92 cents.

Playa Del Rey—Subject to a field gathering charge of 5 cents per barrel.

Newhall, McKittrick and Kern River—Standard Oil Co., effective June 23, 1931, posted 55 cents for oil of all grades.

Elwood Terrace—Standard Oil Co., effective June 26, 1932, posts 33-33.9 degrees, $1.04; 34-34.9 degrees, $1.10; 35-35.9 degrees, $1.16; 36-36.9 degrees, $1.22; 37-37.9 degrees, $1.28. All prices f.o.b. ships.

Ventura Avenue—General Petroleum Co. and Associated Oil Co. effective June 26 posted as follows: 22-22.9 degrees, 72 cents; 23-23.9 degrees, 77 cents; 24-24.9 degrees, 82 cents; 25-25.9 degrees, 86 cents; 26-26.9 degrees, 90 cents; 27-27.9 degrees, 93 cents; 28-28.9 degrees, 96 cents; 29-29.9 degrees, 99 cents; 30 degrees and over, $1.02.

Potrero—Associated Oil Co., effective June 26, posted same prices as are paid by all companies in Athens, Rosecrans and Domingues

American Companies May Revive Activity in Mexico and Establish New Export Bases

By A. E. MOCKLER
New York Bureau, The Oil and Gas Journal

NEW YORK, Oct. 3.—Serious consideration is being given by several major American companies to plans for a general revival of producing and refining operations in Mexico, and the establishment of a new exporting center at Tampico, supplementing or replacing export operations at the United States Gulf, and possibly California, it is learned here. The plans, still in the embryonic stage, it is understood, contemplate considerable acitvity in pipe line reconditioning and construction, and the building of new refineries in the Tampico area.

There are several factors responsible for the reawakening of interest in the potentialities in Mexico. Unfavorable legislation in Colombia and Argentina have tended to keep at a standstill development operations in those countries by a number of the large companies which hold acreage or options there, with a natural reaction toward Mexico as the locale for near-by foreign operations. The tariff situation is likewise a factor. At the present time, only Standard of New Jersey and Shell, of the American companies interested in South America, have extensive refinery facilities in that territory, and some of the other companies, with crude production and acreage, but without refining facilities, feel that they are at a disadvantage in competing with these companies in foreign sales and in the supplying of foreign marketing subsidiaries. Not only are these two companies in position to effect marked savings through refining their South American crude close to the source of supply, saving long-haul tanker charges, but competing American companies are further handicapped through the necessity of paying the import duty of 21 cents per barrel on all of their South American and Mexican crude shipped to the United States for refining, with indications that this base tariff rate will go higher. Independent American producers, it is understood, will wage a determined fight for a duty of $1 per barrel on all crude imports during the next session of Congress.

Major factors in Mexico at present are Royal Dutch-Shell, through Mexican Eagle Oil Co., Ltd. (Aguila); Standard of New Jersey, through the operation of its own producing properties and the producing, transporting and refining properties of Mexican Petroleum Co. (taken over from Pan American), and Pierce Oil Co., subsidiary of Sinclair Consolidated Oil Corp. (Consolidated Oil Corp.), which also has production, refining, and marketing in Mexico.

A number of other American oil companies, including Gulf, Penn-Mex, Agwi (Warner-Quinlan), The Texas Company and others, have considerable acreage holdings in Mexico, although producing operations have been greatly curtailed or virtually at a standstill for the past few years. Standard of California not only has acreage in Mexico, but is likewise a marketer, shipping California gasoline by tank car into the country. A number of Mid-Continent and Texas refiners market limited quantities of gasoline in Mexico, along the border, shipping by tank car.

Withdrawal From Export

The past few years have witnessed a pronounced drop in petroleum activities in Mexico, and the gradual withdrawal from export markets in the face of growing competition from Russia, Rumania, Trinidad and the refineries in the Dutch West Indies. Total exports from Mexico during 1931 comprised but 5,698,199 bbls. of refined products and 6,547,745 bbls. of fuel and gas oils. Of the entire exports of crude and products from Mexico last year, 8,207,000 bbls. went to the United States, against 10,093,000 bbls. in the preceding year. Europe continued a buyer of heavy Mexican crude, largely for use in the manufacture of asphalt, and considerable Mexican crude came to the United States for the same purpose.

In the face of growing competition from Venezuela, Colombia and other South American countries, Mexico during the past decade has sponsored some weird oil legislation, often bordering upon the confiscatory stage, and the result has been inevitable. With few exceptions, major foreign interests have transferred their activities from Mexico to these newer producing countries, with a consequent lessening of producing and refining operations in Mexico, a rapid drop in that country's position of importance among the world oil-producing nations, and a definite loss of revenue to the Mexican government.

While current petroleum regulations in Mexico are far from ideal, from the standpoint of the foreign operator, it is believed in oil circles here that conditions have now reached the point where the Mexican government will be willing to meet foreign oil men half way in modifying existing petroleum laws, if thereby a recrudescence of oil activity in Mexico can be assured.

Although world oil market conditions at the present time do not appear to be favorable for the expansion of existing producing and refining facilities, the Mexican situation presents several aspects which would appear to make an exception to the general rule. In the first place, the companies now contemplating a revival of their Mexican operations already hold considerable acreage in that country and a substantial amount of shut-in production, as well as pipe line and storage properties, with fixed carrying charges, all of which represents nonproductive investments at the present time. In addition, their holdings have been thoroughly surveyed geologically, production potentialities are fairly well defined, and production costs are relatively low. Aside from these factors, Mexico itself presents an attractive market, steadily growing as road building progresses and it is considered possible that export business to some parts of the world may be handled more profitably out of Mexico than out of the United States.

The only additional investments required on the part of these companies, aside from the reconditioning of their field properties and whatever additional drilling may be necessary, is the repairing of existing pipe lines, construction of new lines or movement of shallow-draft tankers to the Panuco River, and most important of all, construction of refining facilities. Refinery construction costs are now at their low for some years, and refining technique and equipment has been improved to the point where Mexican crudes can be more easily and profitably handled than ever before. The world's export markets are in a state of flux, and it is felt that now would be a propitious time for an extension of the realignment movement to bring Mexico back into the picture more prominently, and "cash in" on long standing investments in that country.

Conflicting Reactions

None of the interests credited with planning a renewal of activities in Mexico is willing to comment on the situation at this time. In some quarters, the report meets with unqualified denial, while in other circles there is the cautious admission that "there may be something doing."

Notwithstanding these sentiments, however, it is indisputable that a number of companies are giving serious consideration to the matter of resuming activities in Mexico, and basing some of their export business in the vicinity of Tampico. While no immediate action in this direction is indicated, it is expected that surveys will be carried out quietly, and further aspects of the situation closely studied before a final decision is arrived at.

May Modify Colombia Laws

A number of proposed modifications to Law 37, the petroleum law of Colombia which has aroused so much protest among foreign oil interests, are now before the Colombian congress, according to reports from Bogota.

The amendments, most of which are designed to liberalize the law, provide for changes in the manner of handling titles to private lands, reduce storage charges on government oil, modify the summary suit feature of the present law in respect to private titles, eliminate the payment of production taxes in kind and reduce this tax by 50 per cent, and relieve production for international consumption from production taxes or royalties.

In view of the present strained relations between Colombia and Peru, however, it is not expected that the present session of the Colombian congress will get around to consideration of the petroleum law, and oil interests look for maintenance of the status quo until next year or later.

Gulf Oil Corp. has selected four sites for drilling in its Barco Concession in Colombia, and is moving in two rigs to commence drilling operations, according to private advices from Botoga.

Development of the Barco Concession by Gulf Oil is under the terms of a special concession with the Colombian government, and the company's operations are not affected by the provisions of Oil Law 37 in Colombia, which has deterred other American oil companies (with the exception of Standard of New Jersey, whose Colombian subsidiary also operates a special concession) from continuing exploratory or exploitation activities in Colombia.

Late Fields

KANSAS

Phillips Petroleum Co.'s No. 1 Warkingtine, NW cor. SW SW, Section 20-22-3w, in the Hollow Pool, in Harvey County, Kansas, flowed 1,033 bbls. of oil in 19 hours from the Hunton lime at 3,381-95 feet. It extends production in the area a quarter of a mile to the south.

W. C. McBride, Inc.'s No. 2 in Section 20-22-3w, in the Hollow Pool, flowed at the rate of 68 bbls. an hour from the Hunton lime at 3,489-3,505 feet.

New wells completed on the Winfield Townsite in Cowley County include the following: McNabb and others' No. 1 Southwestern College, NW cor. SE, Section 11-32-4, made 188 bbls. of oil the first 24 hours from Siliceous lime at 3,419-23 feet, and 94 bbls. the second 24 hours. Deal Oil & Gas Co.'s No. 1 Cloud, SE cor. NE SE SW, Section 22-32-4, swabbed 5 bbls. of oil per hour from the shallow sand at 2,338-58 feet. It was shot with 90 quarts and then flowed 200 bbls. the first 24 hours.

McPherson Oil & Gas Co. and others' No. 3 Lovett, C SE NW, Section 13-19-2w, in the Ritz-Canton Pool, in McPherson County, swabbed 135 bbls. of oil in six hours and was shut in.

OKLAHOMA

The Continental Oil Co. is constructing a pipe line from its main pipe line to L. H. Wentz and others' No. 1 Wolff, in Section 17-20-2w, Noble County. The main line of the Continental Oil Co. is approximately 3½ miles east of the well and is an 8-inch line that runs from the Oklahoma City Field to the company's refinery at Ponca City. The owners of the L. H. Wentz and others' well expect to take a 10-day potential gauge of the well as soon as the pipe line is completed.

Umpire Ray M. Collins says that under the order of the Corporation Commission for the first 15 days in October the percentages of allowed production in the Greater Seminole area will be approximately the same as in the previous order, which was extended from the last 15 days of September.

Resolutions on Oil Price Passed at Tyler Meeting

TYLER, Tex., Oct. 3.—A meeting of oil men, bankers, publishers, state officials and business men, including representatives from Oklahoma and Kansas, took part in a conference on the southwestern oil price structure here last week, when the following resolutions were adopted:

"Resolved, that it is the sense of this gathering that it would be unwise, uneconomic and unjust to reduce the price of crude oil, which does not now equal the average cost of production;

"That if upon investigation it is found necessary to curtail production, such reduction should be accompanied by an increase in price in proportion to the reduction in production.

"That the whole policy of proration is at stake in the decision as to whether or not present crude prices shall be maintained on the basis of present production, and increased if further curtailment is found to be necessary by the duly constituted authorities of the several states.

"Such authorities are urged diligently to direct their efforts to prevent illegal production and evasion of taxes, since these practices have tended to undermine markets and deprive the industry and the states of the benefits they were promised as a result of the proration policy."

DEATH OF O. K. EYSENBACH

Oscar K. Eysenbach, veteran oil producer and supply manufacturer, died at his home in Tulsa on Monday, October 3, after several years of ill health.

Mr. Eysenbach was president of the Robinson Packer Co. of Tulsa. He moved to Oklahoma from the East in 1903 and operated in the northern Oklahoma fields, opening the Lost City Pool, near Tulsa, in partnership with the late Grant Stebbins. He also operated in the shallow Bartlesville sand fields in the Nowata-Chelsea area. Mrs. Eysenbach survives, together with one daughter and several brothers and sisters.

Oil and Gas Content as Suitable Standards of the Rights of Each Land Owner in Pool

By E. H. GRISWOLD
Continental Oil Co.*

The many complexities arising from our present oil pool proration systems emphasize the need for a suitable standard of property rights. Attempts at conservation and unitization agreements have frequently failed because of the lack of such a standard.

The necessity of reducing production to consumption has caused umpires, committees, commissions and other governing bodies to allocate the production of flush fields among the respective owners. The methods of allocation vary widely and conservation of underground reserves is frequently neglected or misused.

Critical economic conditions increase, rather than modify, competitive methods. In some fields we have irregular and uneconomically close well spacing. Many operators drill unreasonably large holes, take excessive sand penetrations or leave their wells untubed in order to secure higher potential open flow tests than their offsets. All of these practices result in economic waste and frequently damage to the pool.

Regardless of our agreement with the fundamental principles of proration or troleum looks upon proven reserves in a different light as compared to the one who produces only.

The operator who places the greater proportion of his exploitation expenditures in geological exploration and leases only selected acreage has a different aspect of unproven areas than one who checkerboards large spreads of acreage with little geological expense.

The small producer who has few other prospects cannot assume a give and take attitude in the trust of balancing out in the average of several projects.

The royalty owner has little interest in the relative development and operating costs of various tracts, as the operators are obliged to protect each tract from drainage. The royalty owners desire increased recovery and ample drilling and although the two are usually synonymous they are not always consistent with the greatest economic yield to the operator.

There are certain dangers to the operator as a result of the standardization of property rights. Definitely established rights may promulgate drainage suits on our currently operated properties. The

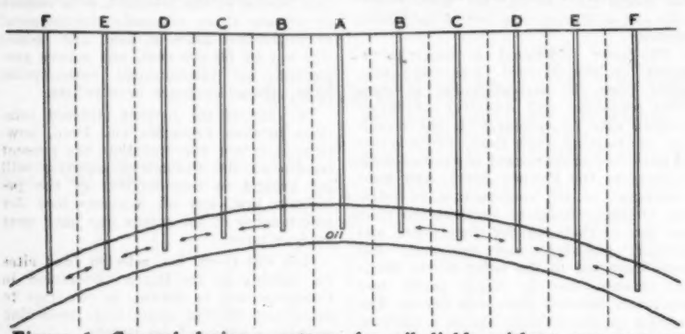


Figure 1—General drainage pattern for oil fields without gas area or active edge water

unitization, both are actual necessities in many of our present economic situations, and we are in urgent need of a suitable standard of rights to facilitate and simplify their operation.

The problems pertinent to unit management are simple and of daily use in many partnership enterprises, but the problems of fair and proper division of production under either proration or unitization are, as yet, subject to controversy. The rights of respective owners must be ascertained and standardized before we can eliminate wasteful practices and still preserve constructive competition in our industry.

Valuation of Tracts

In a recent unitization conference it was found that each participant had a different basis for calculating the relative values of tracts. Some of these assumptions were as follows:

(a) Unrestricted open flow operation to abandonment.

(b) Current proration system to abandonment.

(c) Strict enforcement of conservation laws without proration.

(d) Oil content in place under various tracts.

(e) Present market value.

(f) Nuisance value to remainder of pool.

The valuation aspects of different operators vary with their status. The producer who also refines and markets pe-

present legal status of these rights appears to be so confusing that there is no substantial basis for drainage suits, but if these rights are definitely ascertained there will undoubtedly follow many just or unjust claims for damages, regardless of whether a new legal ruling is retroactive.

The lawyers inform us that we have two rather contradictory laws applicable to oil and gas. In some states oil and gas are not owned until recovered at the surface. In other states they are owned in place underground with the provision that each owner must so use his property as to not injure the contents of any other property. In some states proration, to be legal, must be in proportion to ability to produce oil, while many states have no established system, each pool being prorated according to local regulations. In spite of this haze of legal precedent, we are assured by the lawyers that if a practical and equitable system of allocation of producing rights can be devised, the same can be made legal.

Requirements of a Suitable Standard

First we must establish a practical standard of rights and then we must set up suitable means of protecting these rights, unless such protection is inherent in the standard.

Fortunately we are required to deal only with the relative values of different tracts in a pool, rather than required to determine actual barrels of oil or dollars.

A suitable system must be adaptable to all steps in pool administration, so that relative values will be consistent under unrestricted operation, proration or unitization.

If the relative values of tracts were to change in passing from unrestricted operation to proration or to unitization, the personal interests of the owners would not be consistent with the best interests of the common pool. This is believed to be the major and most difficult requirement of a suitable standard.

To be legally practicable the standard must fit all stages in the development of a pool, all crude price conditions and all oil pools. It must be flexible and yet exact.

From the legal viewpoint only a "reasonable" degree of accuracy is necessary in the allocation of rights. We have several pools with over 100,000,000 bbls. each, expected ultimate recovery, so that 1 per cent is frequently equivalent to at least 1,000,000 bbls. Therefore, the producer's interpretation of "reasonable" runs into several decimals when considering unitization. In contrast are many proration systems in which the accuracy certainly fails to qualify as "reasonable."

Means must be provided for adjusting values as the proven boundaries of a pool are extended. It has also been suggested that the relative values of tracts within a pool can be adjusted on the basis of their subsequent yield. These latter adjustments will prove impractical in pools where it is necessary to alter normal

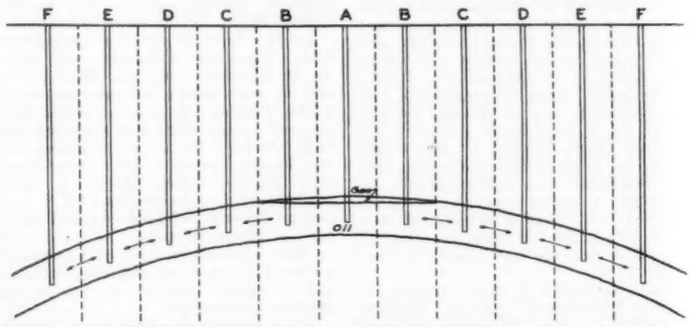


Figure 2—General drainage pattern for oil fields with gas area but no active edge water

drainage patterns in order to affect gas or water control.

There is considerable controversy concerning the owner's rights in those tracts which will not justify drilling, but are subjected to drainage. Some legal interpretations would require their consideration and remuneration. There is, however, an opposite precedent in the Apex mining law, under which the owner of a vein outcrop may mine his vein an unlimited distance at right angles to the strike, regardless of who owns the surface under which he operates. This law permits one operator to profitably mine a vein which could not yield economic returns to several separate operators.

There have been suggestions that oil pools be operated in such a manner that no drainage will occur across property lines, the control being by equivalent bottom hole pressures while wells are producing, or similar methods. Such means may be applicable under ideal conditions but are certain to add to the expense of operation and interfere with conservation measures. Any practical system of establishing rights must not appreciably increase operating expenses or else the cost of theoretical justice may consume the proceeds.

Assuming that a standard of rights which meets the foregoing requirements is obtained, what means of protecting the owner's rights will be available in non-unitized pools? If one owner desires to drill a well, the offset has recourse only to a similar procedure, as certainly his rights cannot be protected by law or otherwise from drainage unless he does drill. After both wells are drilled, one operator having a market for his oil desires to produce all he can without committing waste of his resources. The other with perhaps no market or desire to produce must either store his oil, suffer drainage or secure ratable taking between tracts. The legal status of ratable takings appears to be considerably involved, but the determination of the ratable amounts reverts back to some standard of rights, supposedly determinable by engineering methods.

Comparison of Present Proration Systems

Present proration systems appear to be based on one or a combination of two governing factors. These factors are potential production and acreage. The equal well allowable as used in East Texas is a poor approach to the acreage system, because of the unequal spacing of wells.

Proration in direct proportion to potential production is in effect proportional to sand permeability and thickness. As porosity usually varies somewhat with permeability, this type of proration is roughly proportional to the oil content of tracts in so far as relative rates of production on tracts of equal size are concerned.

Proration by acreage or by acre feet are approximations of oil content in place. Acreage alone is very inaccurate unless sand thickness and porosity are uniform. Acre feet systems have a degree of accuracy comparable to the uniformity of porosity throughout a pool. In proration systems where combined potential and acreage or acre feet are used, the approach to oil content in place is probably more accurate because the average of two methods is used in determining the same problem. The relative weights given each factor in determining the average such as the 25 per cent acreage—75 per cent potential, used in some fields, are strictly arbitrary with no sound basis.

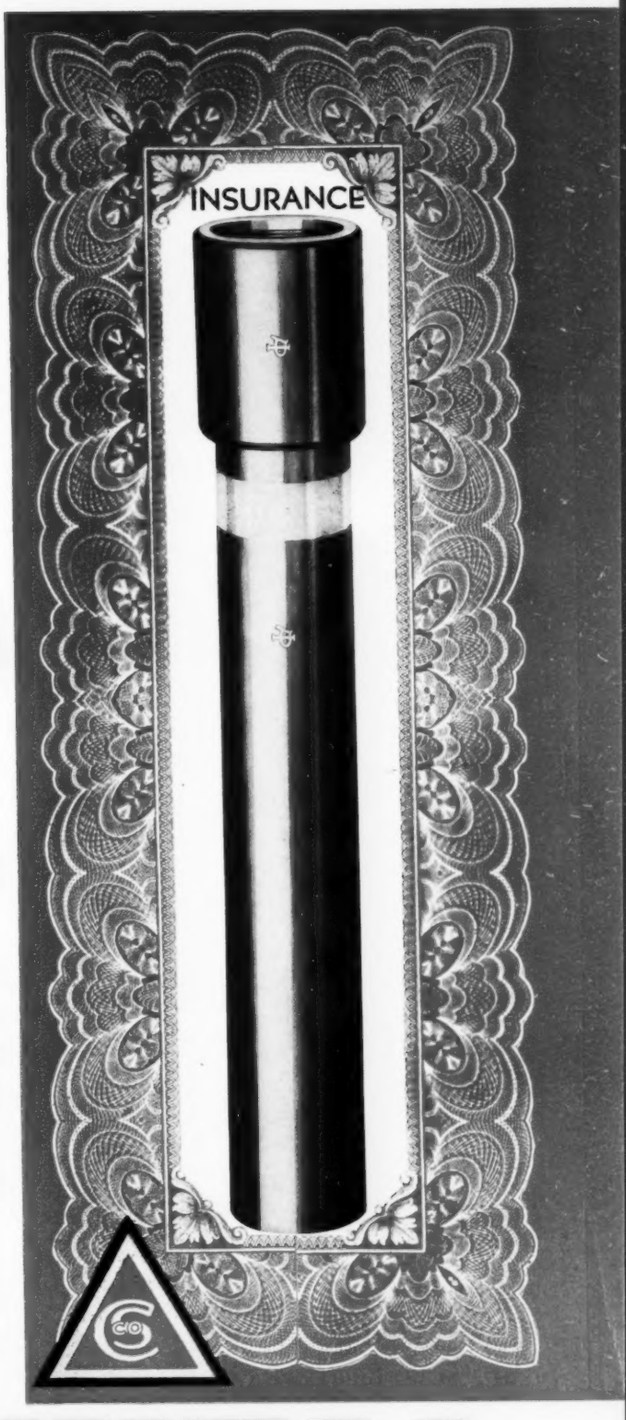
It is, therefore, apparent that our present proration systems tend to allocate the rate of production of various tracts in a pool in somewhat the same proportion as their oil content, but with varying degrees of accuracy, because of irregular well spacing and unequal porosity. In most cases even the actual sand thickness is ignored.

In as much as oil content in place appears to be a widely accepted standard

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

and be sure your casing is GOOD casing

Among problems brought to the attention of the operator by increasing depths of drilling is the load caused by long strings. Obviously extreme care must be excercised, in the choice of material used, as faulty pipe run in a hole may cost many times the price of good casing.



YOUNGSTOWN

CASING

IS GOOD INSURANCE

There is no excuse for using anything but good pipe even in an emergency for immediate delivery of YOUNGSTOWN PIPE - GOOD PIPE - can be had from field stocks or from mill stocks at MEMPHIS CHICAGO - YOUNGSTOWN

"If Continental Sells it There is no Better"

THE CONTINENTAL SUPPLY COMPANY

GENERAL OFFICES: ST. LOUIS

THE CONTINENTAL SUPPLY CO., LTD., 224 Traders Bldg., Calgary, Alberta, Canada
Export Offices: CONTINENTAL EMSCO CO., Inc., 19 Rector St., New York
London Offices: 316-17 Dashwood House, Old Broad St., E. C. 2.
CONTINENTAL EMSCO S.A.R. Strada Marfurilor, Ploesti, Romania

CONTINENTAL

PROTECTION

As the lighthouse stands unfailing guard over reefs, shoals and dangerous shores—a guiding beacon to mariners at sea—so Youngstown Tubular Goods faithfully protect the drilling investment of producers in all of America's oil and gas fields.

Whether it is drill pipe, tubing or casing no other tubular goods can afford greater protection to drilling dollars.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

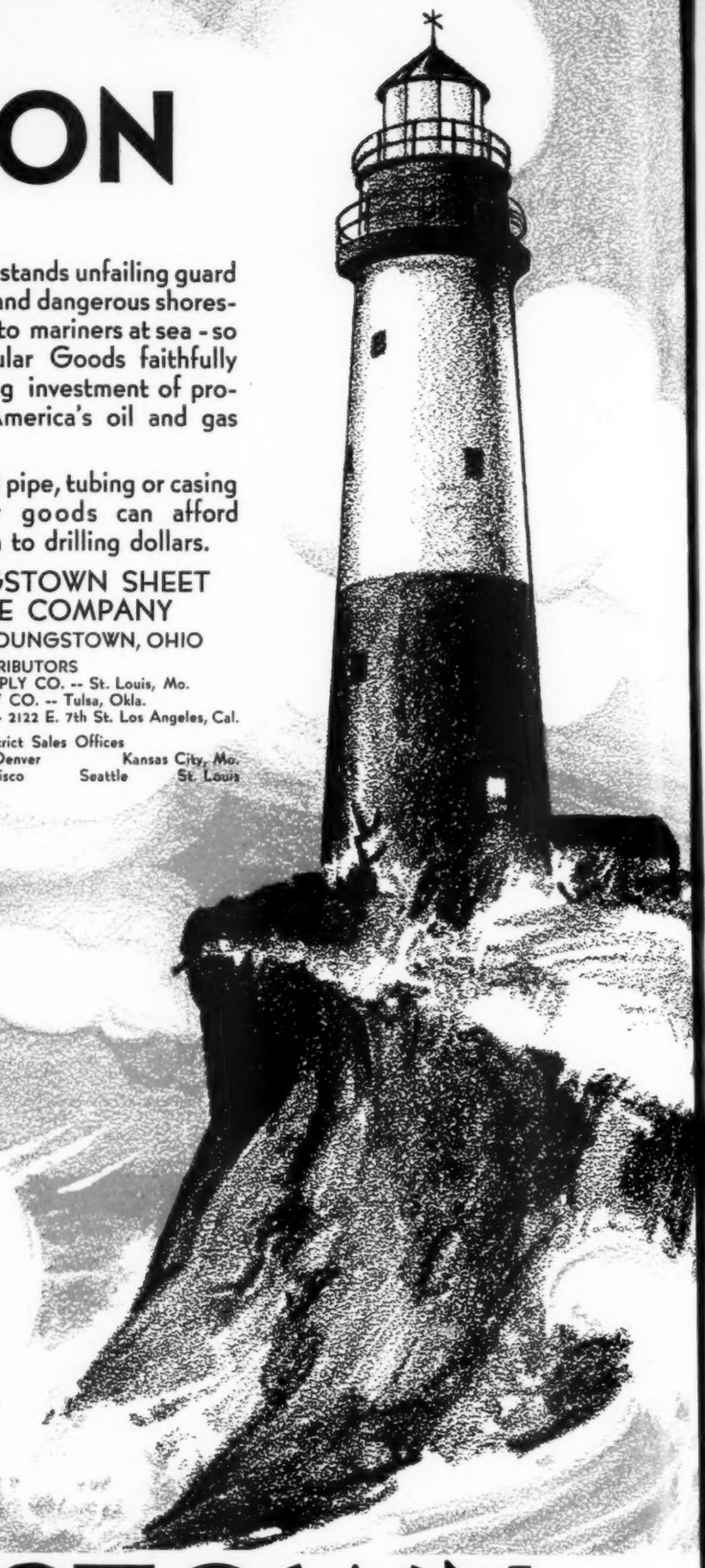
General Offices: YOUNGSTOWN, OHIO

DISTRIBUTORS

THE CONTINENTAL SUPPLY CO. -- St. Louis, Mo.
INTERNATIONAL SUPPLY CO. -- Tulsa, Okla.
REPUBLIC SUPPLY CO. -- 2122 E. 7th St. Los Angeles, Cal.

Western District Sales Offices

Dallas, Denver, Kansas City, Mo.
Los Angeles, San Francisco, Seattle, St. Louis



YOUNGSTOWN

OIL COUNTRY TUBULAR GOODS

of ownership, and by far the most simple from a legal viewpoint, it deserves further consideration in regard to the degree of accuracy obtainable. Factors usually determined with "reasonable" accuracy in the development of the average sandstone oil pool are as follows:

1. Area of productive acreage on each tract.
2. Thickness of producing sand on each tract.
3. Location of gas-oil and water-oil contacts.
4. Reservoir pressure.

Also a fair conception of the uniformity of porosity may be had from initial productions of wells, consideration of course being given to the time element between completion dates. In fields where comparable initial productions vary over wide ranges or where porosity and permeability are known to be inconsistent with respect to each other, recourse may be had to porosity determinations from core samples. However, in the opinion of the writer, initial productions of wells are as representative in regard to porosity determinations as a core from a well is representative of the surrounding acreage.

Using the four factors mentioned above and reasonable porosity estimates, the relative total oil content of each tract in a sandstone pool is easily ascertainable. Limestone pools present more difficult and perhaps insoluble problems.

The determination of recoverable oil content is entirely different than total oil content, unless permeabilities are uniform. An extended discussion of this difference by the writer would lead to no practical conclusions as he knows of no evidence upon which the oil content of tracts can be accurately classified as recoverable or unrecoverable in place. The practical difference will be negligible in many pools but will be indicated in other pools by the failure of tracts to meet their allocated producing rate at some period in their life. In this manner any inequities resulting from differences between total oil content and recoverable oil content will be approximately adjusted in the practical application of the oil content theory to proration.

Underground Status of Oil and Gas

As our data on the recovery from oil pools pertain only to the oil recovered through wells on certain tracts and not to the oil originally contained under these tracts, we have no definite information upon which to decide from whence the oil is produced. To interfere legally or technically with the laws of nature has in most industries been found less satisfactory than an intelligent application of these laws. If the producer's rights can be made consistent with natural drainage, many costly errors can be avoided. A brief review of the theoretical drainage trends in various type oil fields will be helpful in determining the natural process of recovery as compared to total oil in place in the reservoir. For simplicity we can assume that determinable factors such as well spacing, sand thickness, porosity and permeability are uniform in considering Figures 1, 2 and 3, so that the original cubical contents of each tract may be equal.

Figure 1 illustrates the type of pool in which there is no gas area or active edge water. From this type of pool relative recoveries from tracts will closely approximate the relative original distribution of oil underground, if the rate of production is proportional to the oil content under each tract.

Figure 2 illustrates the type of pool in which there is a gas area and high gas-oil ratio area but no active edge water. If the rates of oil production on tracts are proportional to their oil content there may be migration toward the gas areas because of the greater displacement of the gas necessarily produced and the expansion of the dissolved gas within the oil.

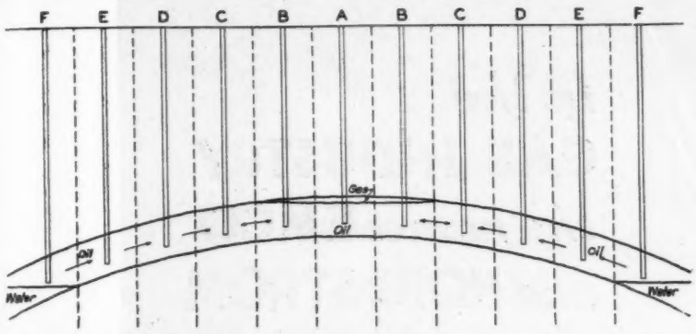


Figure 3—General drainage pattern for oil fields with gas areas and active edge waters, with sand thickness, porosity, and permeability uniform, tracts "C", "D", and "E" originally have equal content of recoverable oil in place. As oil and gas are withdrawn from the pool, the water level rises, displacing oil from "E" to "D" and "D" to "C" etc. Therefore, if all wells are produced open or prorated by any uniform allowance system or by potential or acre feet, the leases "C" will recover more oil than leases "D", leases "D" recover more than leases "E" etc. Waste of gas from "A" and "B" leases will accentuate this effect, but completely closing in the gas area will not modify the pattern

If the rate of total displacement of oil and gas taken from tracts is in proportion to the underlying total volumetric contents of these tracts, there will be migration of oil from the high gas-oil ratio areas to the lower gas-oil ratio areas, because of the expansive nature of the gas as compared to oil. This situation is identical with the results of maintaining uniform bottom hole shut-in pressures throughout a pool in which the pressures are declining.

If the gas and high gas-oil ratio areas are restricted as compared to the low gas-oil ratio areas, there will be down structure migration when oil is withdrawn from the oil areas, as evidenced by the spreading gas caps in several conservatively operated pools.

Figure 3 shows a pool with both gas area and active edge water. If the pool is produced at a faster rate than the water can maintain the reservoir pressure, conditions similar to those of Figure 2 will obtain between the gas and oil areas. If production is restricted to allow pressure maintenance by the encroaching water, there will be continuous upstructure migration if appreciable amounts are produced from the various tracts in the pool. The gas-oil contact can be maintained constant by closing in the gas area, but the water oil contact will be advancing at such a rate as to cause the productive lives of the structurally higher tracts to be many times longer than the life of the lowest oil producing tracts. Thus the higher tracts would ultimately produce much more oil than lower tracts of similar original oil content, unless all except the lowest oil producing tracts were kept shut in until each tract had successively recovered its production in the order of their respective structural positions.

Most of our present oil pools fall in the types illustrated by Figures 2 and 3 and are, of course, further complicated by irregular time and location of development, irregular porosity, permeability and thickness of sand and other variables. In spite of these complexities, the outstanding drainage trends shown above persist and may be summarized as follows:

1. Unless high gas-oil ratio properties are permitted to produce at greater displacement rates than lower gas-oil ratio properties, drainage of oil will be from the higher to lower areas in pools where reservoir pressures are not maintained at the original value.

In cases where the normal drainage is artificially disturbed in order to conserve gas, oil and gas are automatically displaced from the high gas-oil ratio tracts to lower tracts.

2. In natural water drive pools the migration of oil is in an upstructure direction unless all except edge tracts have their production deferred until the water-oil contact reaches the boundary of each tract.

Where natural water drive is a factor the higher structural operator appears to have an inherent natural right to a longer producing life and greater recovery.

The above two trends will affect the relative recoveries of tracts as compared to their oil content in a degree roughly proportional to the average permeability of the reservoir rock in the pool. That is, the effects will be much more severe in pools of high initial well production and may account for as much as 100 per cent difference between the recoveries of tracts which are identical except for structural position. It would, therefore, appear unwise to neglect these natural laws in devising a system of rights.

A Suggested Standard of Rights

The principal difference between allocating production under proration as compared to unitization or common ownership is the abandonment feature. When a prorated property is no longer capable of producing, the owner ceases to obtain any income from the property. Under common ownership of the pool, each participant shares until the exhaustion of the entire pool, regardless of the status of his formerly owned tract.

Because of the natural drainage trends outlined in the preceding discussion, a tract owner has a natural right to the profits resulting from any longevity of his tract, as compared to other tracts. A tract owner should also be entitled to any oil secured by the failure of another owner to promptly and properly protect his property by drilling. These two elements may somewhat complicate the legal interpretation of property rights but they are practical factors which cannot be avoided unless enterprise, competition and chance are eliminated from the industry.

The owner of tracts which must be closed in or restricted for conservation purposes, should be compensated for oil and gas lost by drainage and the deferred recovery of his remaining products. These damages can be determined with sufficient accuracy to satisfy the owner because of the stringency of present conservation laws if actively enforced. To deny compensation to the tract owner who closes in his property for the benefit of the pool would be obviously unfair and illegal. The condemnation of right of way for public improvements is a similar procedure and always carries just compensation to the landowners involved.

It is, therefore, suggested that the following standard of rights is suitable for allocating the production of oil pools:

1. Oil should be produced from tracts at a rate proportional to the total oil calculated to lie underneath the respective tracts, except in cases where the production of tracts is restricted to affect conservation of natural resources and the owner justly compensated therefore.

2. Oil produced from tracts prior to the completion or after the abandonment of wells on neighboring tracts should be the property of the party recovering the same.

This suggested standard will be of greater accuracy than our present proration systems and also establish a basis upon which unitization can proceed. In unitization projects where common ownership is desired, it will be necessary to evaluate the relative longevities of tracts while producing under the suggested system. No definite formula can be devised for such a determination and common ownership of oil properties will always be as much dependent upon the human element as any other merger of resources whether they be tangible or intangible.

The practical application of this standard of rights in its simplest form is dependent upon uniform well spacing. In pools where development is incomplete, or well spacing is not uniform, the area used to determine oil content per well should be the area included within a circle drawn with the well as a center and the nearest property line or similar sized circle on the same lease as the radius limit. Cases of interference of circles can be determined as indicated upon Figure 4. The adoption of this modification will prevent unfair drainage under conditions of irregular well spacing and also promote wider and more uniform spacing patterns.

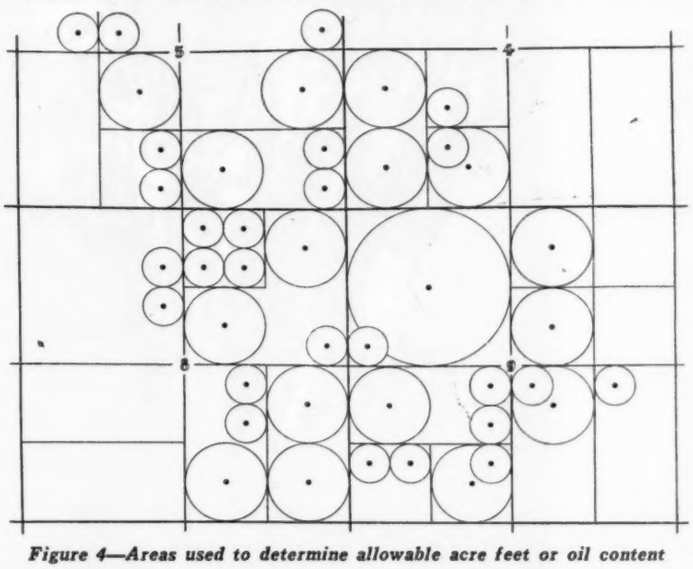


Figure 4—Areas used to determine allowable acre feet or oil content

Conclusion

It is realized that the suggested system is not theoretically ideal, but it is believed to be equitable and practical and within the limits of accuracy obtainable from oil field data at reasonable expense. It is certainly superior to our present proration systems and is believed to be legally applicable as a standard of oil property rights.

SUE STANDARD OF KANSAS

The Bonnelly Process Corp. September 26 filed suit in Federal court at Fort Scott, Kans., against the Standard Oil Co. of Kansas alleging the infringement of patents owned by the plaintiffs at the defendant's refinery located at Neodesha, Kans. The refinery is now owned by the Standard Oil Co. of Indiana through purchase from the Standard of Kansas.

It's Unan

In the **GAS INDUSTRY** *the names* **EMCO** *and* **NORDSTROM** *are associated with equipment of only the very highest quality.*

EMCO and NORDSTROM products are built from the finest raw materials, by the manufacturers of the largest and most complete line of lubricated plug valves, meters and pressure regulating equipment in the world.

EMCO and NORDSTROM products are playing an important part in the transmission and distribution activities of the manufactured and natural gas industries.

PITTSBURGH EQUITABLE METER CO.
MERCO NORDSTROM VALVE CO.

MAIN OFFICES, PITTSBURGH, PENNA.
FACTORIES: PITTSBURGH, TULSA, OAKLAND, CAL.

Branch Offices and Warehouses

BOSTON BUFFALO NEW YORK COLUMBIA NEW ORLEANS ST. LOUIS CHICAGO
SAGINAW DAVENPORT SALT LAKE CITY TULSA DENVER
SEATTLE KANSAS CITY LOS ANGELES

inous!

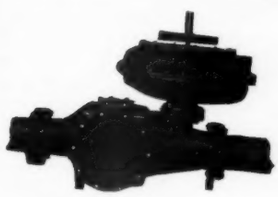
The EMCO NORDSTROM Ticket

for accurate measurement and positive control

EMCO METERS

Made in a complete range of sizes, for every kind of service. No single type of meter is suited to all requirements. For this reason Pittsburgh Equitable builds a complete line of domestic and large capacity meters. Among them you will be sure to find an accurate meter that suits your requirements.

X



EMCO REGULATORS

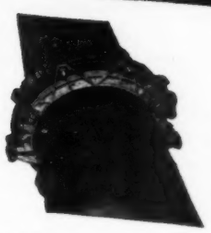
"Super-sensitive", the tribute paid by gas engineers everywhere to EMCO Regulators. Available in the proper size and type for every application where gas pressures must be controlled.

X

NORDSTROM VALVES

"The perfect application of a principle." The Nordstrom method of "Sealdport" lubrication has made practical the use of plug cock valves as large as 30" in size. The most satisfactory service is assured through their leak resistant, non-sticking and positive shut off construction.

X



EMCO BELL JOINT CLAMPS

This clamp is designed specifically for one purpose—to stop leakage at the joints in existing cast iron bell and spigot pipe. The EMCO clamp is sectional in construction and may be applied to the joints without disturbing the line.

X

Applying Subsurface Pressure Determinations to the Problems of Oil Well Production

By D. G. HAWTHORN
Production Engineer, Barnsdall Oil Co.*

Owing to the remarkable growth of interest shown during the past year in the study of subsurface pressures, it may be well to mention briefly a few facts relative to its early development. Of course, it is impossible to set an exact date when constructive thinking on the subject first began. Nevertheless, we have evidence of thought being given to the problem as far back as 16 or 17 years ago. There is record in one of the foreign journals of actual subsurface tests being made by crude methods in one of the Rumanian fields in 1918 and 1919[1]. These tests were performed in conjunction with studies being made on wells produced by bailing and, incidentally, the final outcome of the work led to the development of the so-called "duplex bailer" which is reputed to have trebled volumetric bailing efficiency. From this time on to 1927, a few scattered bottom hole pressure determinations were made with makeshift instruments of one form or another, but probably not until 1927 was any great amount of conscientious effort directed to the subject.

At this same fall meeting four years ago was presented one of the first publications[2] to appear in this country, written with the express intent of advocating the value and importance of subsurface pressure determinations. This paper is thought to be the first to present direct data on subsurface pressures obtained through the use of a specially designed recording instrument. As might be expected, the instrument had its obvious limitations, but reasonably accurate results were obtained and, to say the least, it constituted a progressive step in the right direction. From 1927 to 1931 was taken up in the designing and perfecting of subsurface pressure instruments suitable to meet all conditions encountered. This proved to be a task of considerable magnitude and much credit is due the men who pioneered this work. They should feel a keen sense of satisfaction in the thought that their efforts have paved the way for the continuation of this most valuable study.

At the present time there are more than a dozen companies operating subsurface pressure instruments in the Mid-Continent Field. Engineers in charge of the work are kept busy reporting to their operating and executive managements information obtained through their work. Although with several companies the work has become almost routine, there are nevertheless many persons not closely associated with the work who are still unfamiliar with the importance of its scope of application and the future possibilities which lie within its folds. It is, therefore, the purpose of this paper to present a more or less general resume of the subject of subsurface pressures, to point out their application and to illustrate in detail a few of the many instances which offer interesting and valuable interpretations.

Calculating Bottom Hole Pressure From Surface Pressure

Opinion is greatly diversified regarding the use of surface pressures in calculating bottom hole pressures. Due to obstacles of one form or another there are cases in which it is impractical, if not impossible to run the average pressure bomb; likewise, there are many instances where the surface pressure holds no relation to the bottom hole pressure and accurate calculation of such a pressure is impossible. It may be, therefore, of value in clarifying our thoughts to draw up a few "rules and regulations" whereby one may be reasonably guided in his interpretation of surface pressures.

Rules and Regulations

To facilitate satisfactory understanding and ease of explanation it will be convenient to divide all wells into two classes, as follows: (A) Wells in which all gas is in solution at the bottom of the hole, such as a well in the East Texas Field, and in which the head of oil in the hole is sustained purely through hydrostatic pressure. Further, for the sake of convenience, let us call such a well, whose pressure is more than sufficient to maintain a solid column of fluid to the top of the hole, an artesian well, and one whose pressure will maintain only a partial column a semiartesian well. (B) All wells not involved in "A" and in which there is free gas existing in the formation.

A

1. Bottom hole flowing pressure cannot be reliably calculated on either an artesian or a semiartesian well due to continuously changing temperatures and the liberation of gas.

2. The calculation of bottom hole static pressure for semiartesian wells is impractical due to the necessity of making subsurface observations of fluid level each time a calculation is desired.

3. By taking a few simple precautions the bottom hole static pressure in an artesian well can be easily calculated from the following formula:

$$P = \frac{D}{K \times G} + p$$

Where:

P is desired subsurface pressure.
D is depth of desired pressure.
G is flow column specific gravity of oil.
p is surface pressure.
K is 43.43 (wt. per 100 ft. column of water).

The specific gravity of the oil within the flow column may be readily obtained from one single static gradient test with a pressure bomb. The calculation is simply the ratio of the pressure drop within the flow column per unit of length to the pressure drop or weight of an equal length column of water. An example of this calculation is shown in Curve 1, Figure 1.

4. To obtain accurate results, care must be taken regarding the temperature of the oil in the flow column. Preferably, no tests or observations should be made less than 24 hours after the well has been flowed, thus giving the oil in the column a chance to reach stable earth temperature.

5. Precaution also must be taken in bleeding off the small pocket of gas which accumulates at the top of the hole. This must be done slowly so as not to decrease the pressure sufficiently to start gas out of solution and cause a frothy condition of the oil in the top of the flow column.

Wells in the East Texas Field furnish a striking example for the application of this method of calculating bottom hole or subsurface pressures. By closely observing the above directions, results under one-half of 1 per cent of error should be obtained.

B

1. To calculate static or shut-in pressure on wells of this type, in which free gas exists at the bottom of the hole, is usually impossible as conditions are virtually the same as in a "semiartesian well." Occasionally in wells of very high gas-oil ratio the formation pressure may be very closely calculated due to the fact that on closing the well in, pressure is built up so rapidly that no fluid head is allowed to accumulate. An illustration of this instance is shown in Curve 1 of Figure 5.

2. Unless a well of this type is tubed, the bottom hole flowing pressure can in no way be reliably calculated. Acknowledgement is made to those men who have studied and are studying the derivation of formulas for calculating pressure drop in flow columns, but as yet it is believed the work is still in the experimental stage.

3. If it is certain that the fluid within the static column is depressed to the bottom of the tubing while the well is flowing, the bottom hole pressure, or more correctly speaking, the pressure at the bottom of the tubing can be accurately calculated from either of the following formulas:

Derived by Marian Dice, General Petroleum Corp. of California.

$$\text{Log}_{10} P = \frac{S \times Z}{122.82 \times T} + \text{Log}_{10} p$$

Where:

P is bottom hole pressure, absolute.
Z is depth of tubing inlet in feet.
S is specific gravity of gas.
T is absolute temperature of gas (t° F. + 460).
p is surface pressure, absolute.

Derived by Pierce and Rawlins, Depart-

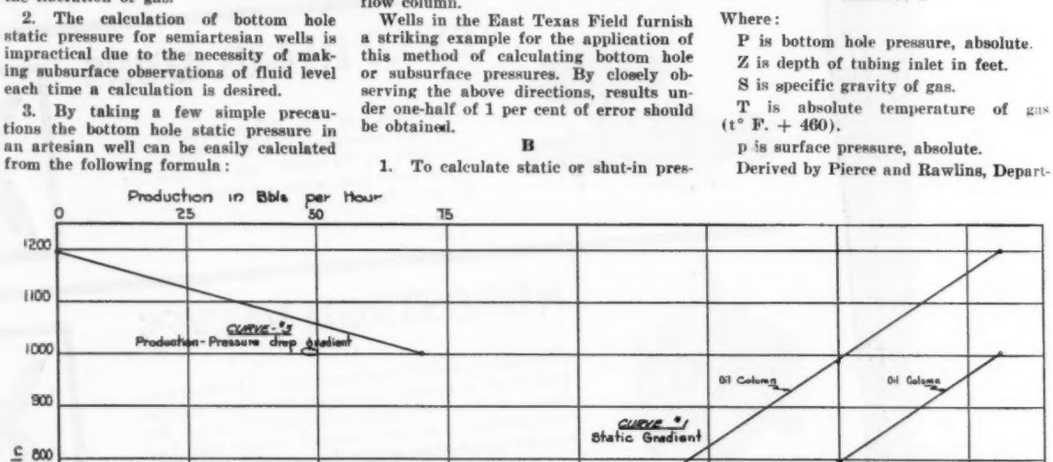


FIGURE - 1 - SUB-SURFACE TESTS MADE ON EAST TEXAS WELL

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla., Sept. 30-Oct. 1, 1932.

[1]Test performed by J. T. Hayward—Rumanian Consolidated Oil Fields, Ltd.

[2]Sclater, K. C., and Stephenson, "Measurement of Original Pressure, Temperatures and Gas-Oil Ratio in Oil Sands," Transactions, A.I.M.E., Petroleum Division, 1928-29, p. 119.

ment of Commerce, U. S. Bureau of Mines, R. I., No. 2,929, p. 9.

$$P = p\,(e^{.0000187\,G\,L} - 1) + p$$

Where:

P is bottom hole pressure, absolute.
p is surface pressure, absolute
e is base of Nap. Log (2.71828)
G is specific gravity of gas
L is length of producing string
(An average temperature of 80° F. is assumed.)

These formulas were derived for the purpose of calculating the weight of a static column of gas. A practical application of each of these formulas is shown in Figure 5. The results are seen to check very closely with the pressure obtained at the corresponding depth from the pressure bomb.

4. It is impossible to mention here all of the cases where bottom hole pressure on this type of well can or cannot be calculated from surface pressure. The greatest difficulty is probably encountered in making sure that the static column is completely filled with gas. Frequently, bridges of colloidal rotary mud or slugs of more or less permanent oil froth may be entrapped in the column. Also the position of the bottom of the tubing with respect to the point at which oil is entering the hole is of great importance. Undoubtedly, many features enter into the problem and extreme precaution and good judgment must be exercised to insure correct application and results.

Subsurface Pressure Tests

Herein the term subsurface pressure is used to partially replace the more commonly used expression bottom hole pressure. It is felt that the general but frequent improper use of the term bottom hole pressure has created much misunderstanding and has been responsible in some degree for the erroneous impression held that all information gathered in making subsurface pressure tests relates to the bottom of the hole. In as much as there are numerous other terms used, all of which have a more or less specific meaning and if not correctly applied may be misleading, it may be of possible advantage to list a table of definitions.

Definitions

Subsurface Pressure — That pressure within the flow column taken at any point from top to bottom and while the well is under any status of operation.

Depth Pressure—This term is synonymous with subsurface pressure. However, it is thought to be hardly as clear and descriptive.

Bottom Hole Pressure—The subsurface pressure taken at a point opposite the average depth of the producing formation. Unmodified, it usually implies static conditions.

Reservoir Pressure—The pressure existing at any local point within the reservoir. This term is synonymous with bottom hole pressure.

Static Pressure—A subsurface pressure taken while the well is shut in and usually means reservoir or bottom hole pressure unless modified by a specific depth.

Flowing Pressure — A pressure taken while the well is producing and usually refers to a pressure taken at the face of the formation. This term is frequently called bottom hole producing or bottom hole flowing pressure.

Differential Pressure — The difference in pressure between bottom hole static pressure and bottom hole flowing pressure.

Datum Pressure—A bottom hole pressure corrected to a specific sea level or subsea level elevation for the purpose of making comparison.

The above terms have become somewhat standard throughout the Mid-Continent Field. Due to subsurface conditions being so vastly different in California, it may be necessary, as subsurface work progresses in that area, to develop a new and broader terminology in order to facilitate correlation of the work in the two districts.

Subsurface tests may be in general divided into two classes, namely, static tests and flowing tests. In either case pressures may be obtained at any point within the flow column to which a pressure bomb can be lowered, thus giving information from which curves, or pressure gradients, can be plotted. An illustration is shown in Figure 1, where Curve 1 is the static pressure gradient and Curve 2 is the flowing pressure gradient. Curve 3 is obtained by plotting bottom hole pressure against rate of production of the well during the test.

This constitutes all the information in regard to pressure that is directly obtained in making a subsurface test. If desired, bottom hole temperature may be easily obtained by attaching a maximum indicating thermometer to the bomb. A few pressure bombs are designed in such a manner as to give a continuous temperature record.

The importance of these data, simply through their obvious meagerness, have been greatly underestimated. The question is still frequently asked, "What information can bottom hole pressures render other than local formation or reservoir pressures?" The value of subsurface pressure data, like many other classes of field information, lies not in the data but in the interpretation and application. A knowledge of subsurface pressures has long been the "missing link" in the chain of study relative to oil and gas flow in earth reservoirs and well bores. This information is now available and, as our fund of knowledge grows, subsurface pressures are destined to become the "nucleus" around which much practical and theoretical work will be started and from which valuable interpretations will be made both in the field and in the laboratory.

Use and Application of Subsurface Pressures

The practical application of subsurface pressures is becoming constantly larger and larger. So extensive and complicated has the study of their application become that it is necessary, in order to obtain a comprehensive impression, to divide the subject into its component parts. The subject naturally separates itself into two main divisions, i.e., (1) the application to oil reservoirs and (2) the application to individual wells. The following discussions will be divided accordingly.

Application to Oil Reservoirs

Equitable proration and unitization during the past few years have been two of the foremost problems confronting the industry. In turn, both have presented and made necessary the solution of difficult problems of evaluation. In attacking these problems geologists and engineers have frequently found themselves with but few facts and figures upon which to proceed. Subsurface pressures are now, so to speak, offering a new line of attack and are furnishing valuable and concrete information relative to existing conditions in reservoirs.

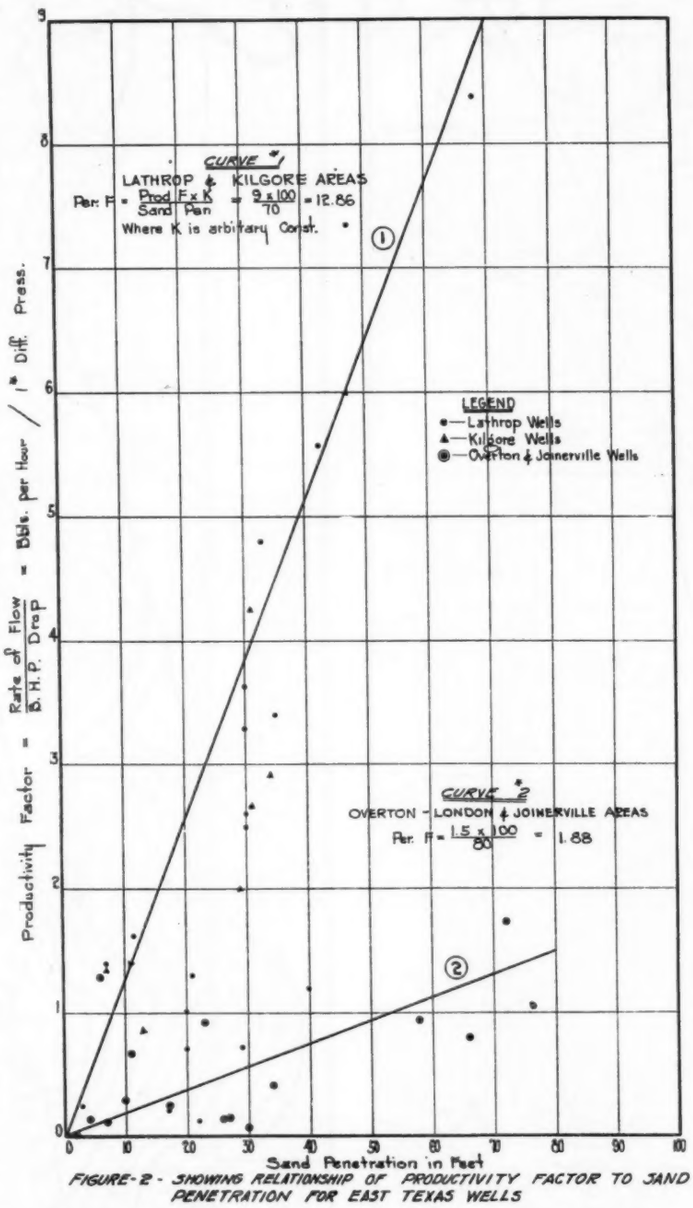

CURVE #1
LATHROP & KILGORE AREAS
Per F = Prod F x K / Sand Pen = 9 x 100 / 70 = 12.86
Where K is arbitrary Const.
①
LEGEND
•—Lathrop Wells
▲—Kilgore Wells
◉—Overton & Joinerville Wells
CURVE #2
OVERTON - LONDON & JOINERVILLE AREAS
Per F = 1.5 x 100 / 80 = 1.88
②
Productivity Factor = Rate of Flow / B.H.P. Drop = Bbls. per Hour / 1# Diff. Press.
Sand Penetration in Feet
0 10 20 30 40 50 60 70 80 90 100
0 1 2 3 4 5 6 7 8 9

FIGURE-2 - SHOWING RELATIONSHIP OF PRODUCTIVITY FACTOR TO SAND PENETRATION FOR EAST TEXAS WELLS

Formation Characteristics

Subsurface pressures, and more specifically, bottom hole static and flowing pressures present valuable information relative to conditions and characteristics existing in the reservoir. Heretofore, only laboratory analysis could supply these data. One of the most valuble contributions that bottom hole pressures has to offer is the so-called "productivity factor."[3] This factor may be defined as "a measure of the capacity of a well to produce." More specifically, it is the rate at which oil is produced from a well per unit of differential pressure.

$$\text{Productivity factor} = \frac{\text{Rate of production}}{\text{Differential pressure}}$$

In as much as the value of this productivity factor directly depends on the same identical factors as permeability, i.e., porosity, saturation, texture, oil and gas conditions, etc., it is also a measure of the permeability of the drilled formation. However, in order to render this measure of permeability capable of use it is necessary to reduce it to a workable basis, therefore:

$$\text{Permeability factor} = \frac{\text{Productivity factor}}{\text{Sand penetration} \times K}$$

Where: K is a factor depending on the diameter of the hole. Thus, the permeability factor may be defined as the capacity of the reservoir in the immediate vicinity of a well to produce oil per unit of differential pressure, per unit of formation penetrated. This furnishes a practical unit upon which an investigation of formation characteristics may be conducted.

In Figure 2 is shown an interesting analysis of sand conditions in the East Texas Field. The productivity factor has been plotted against sand penetration for wells in various parts of the field. It might be called a permeability chart in as much as the slope of each of the curves indicates the relative factor of permeability for the respective districts. This factor is computed and shown on the chart. Obviously, this analysis is broad, especially considering the limited data at hand and it is not desired that too literal a translation be made. Nevertheless, it is thought to be indicative of actual conditions and is cited to illustrate an interesting and possibly a valuable method of comparing reservoir characteristics in individual wells, leases or even an entire pool.

Ultimate Recovery

Attempts have been made to predict ultimate recovery from reservoirs by plotting cumulative production against reservoir pressure and extending the curve as a straight line. Little is known at present as to the nature and trend of these pressure decline curves. The writer believes these curves to be seldom, if ever, a straight line. Argument is presented that any method of evaluating ultimate recovery is an estimate and that this "pressure drop method should be as reliable as any other. The argument is further enhanced by the fact that no percentage recovery factor is necessary, the value of this factor invariably being a moot question. Nevertheless, to proceed with such a calculation is to accept a major premise about which we know little or nothing and which common reason tells us is wrong. To give much merit to such a method of calculation seems illogical.

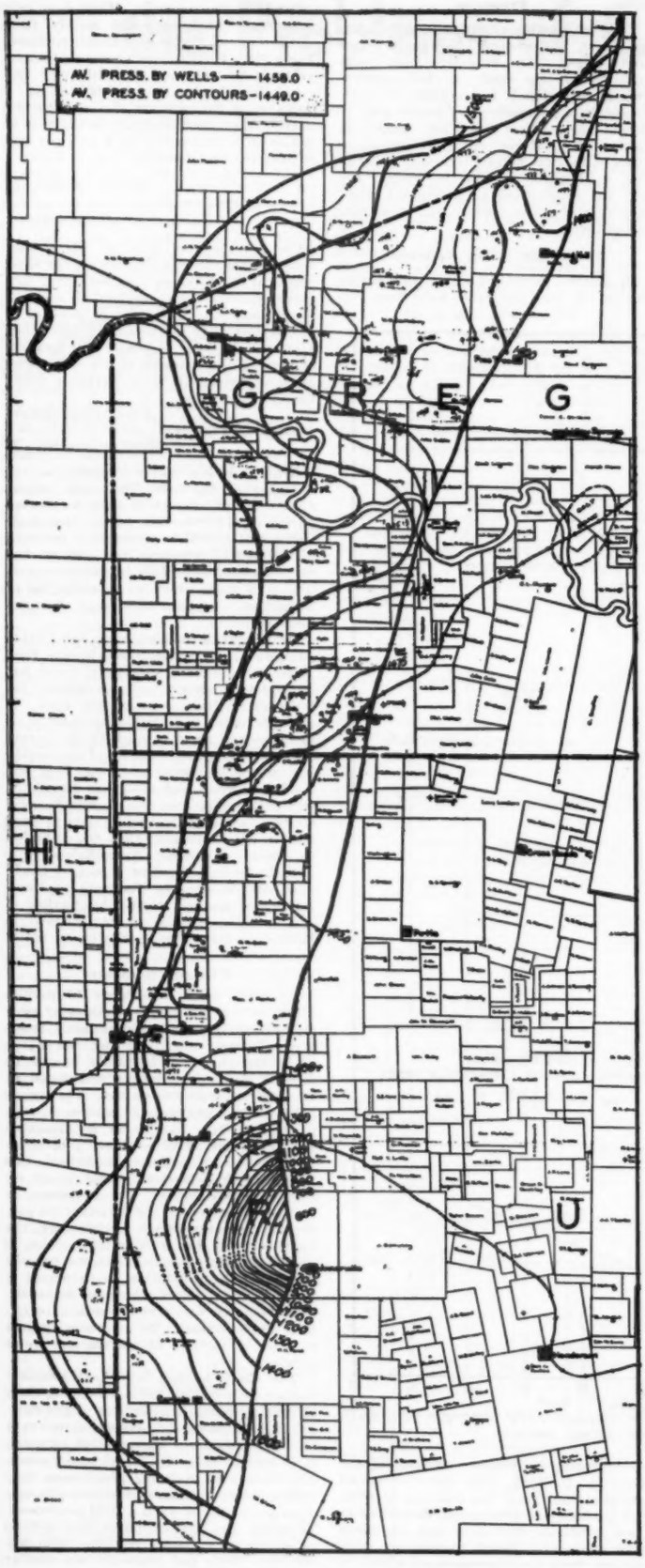
The above method may be reasonably correct for confined fields producing their oil solely through the medium of gas energy. In such cases the pressure drop curve may approximate a straight line although it is known that the gas-oil ratio generally rises with declining production, thus giving evidence of an accelerated pressure drop as the life of such a field progresses. However, the application of this method of estimating ultimate recovery from water drive fields and especially one similar

[3] H. D. Wilde and T. Y. Moore: A Method for Determining Production Allowance in Prorated Fields, A.P.I. Prod. Bull. 207, 71.

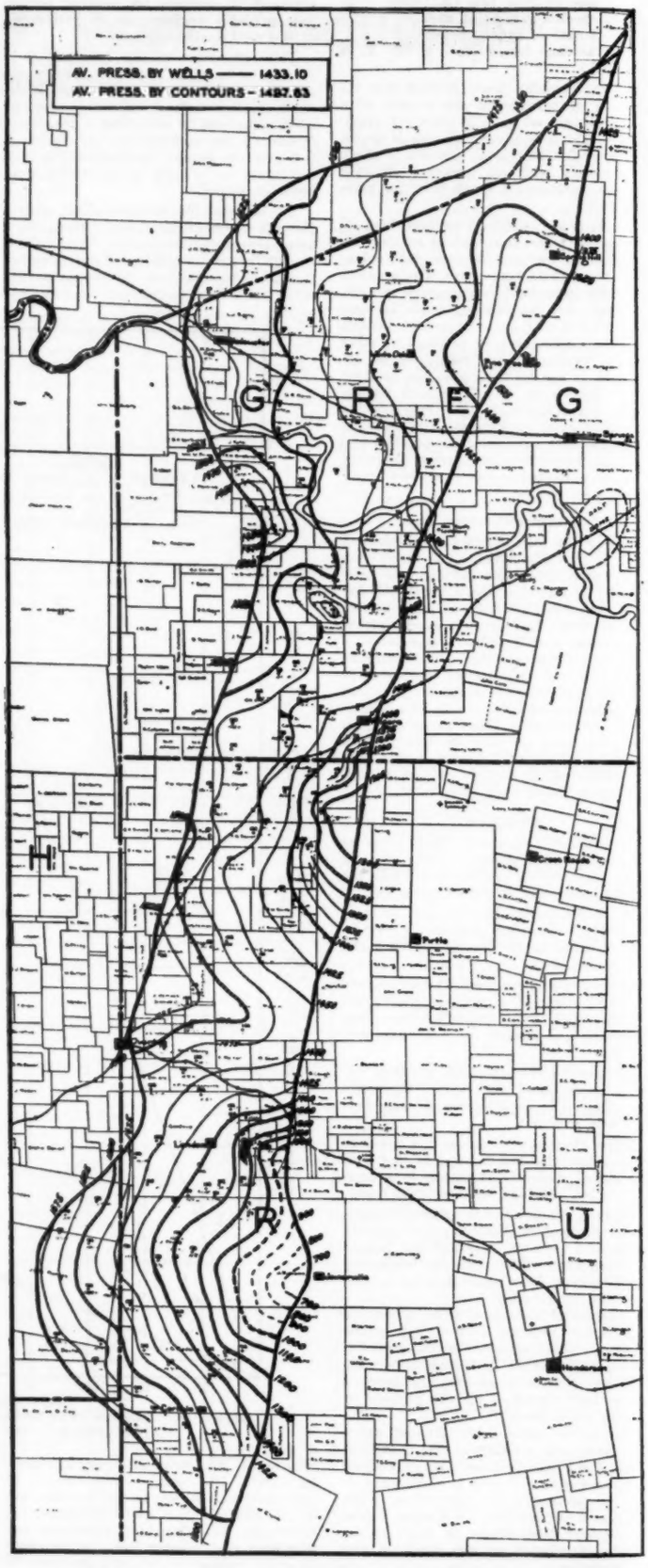
RESERVOIR PRESSURE CONTOUR

CONTOURED ON

FEBRUARY, 1932



APRIL, 1932



DATA COMPILED THROUGH THE CO-OPER

GULF PRODUCTION CO.
HUMBLE OIL & REFINING CO.

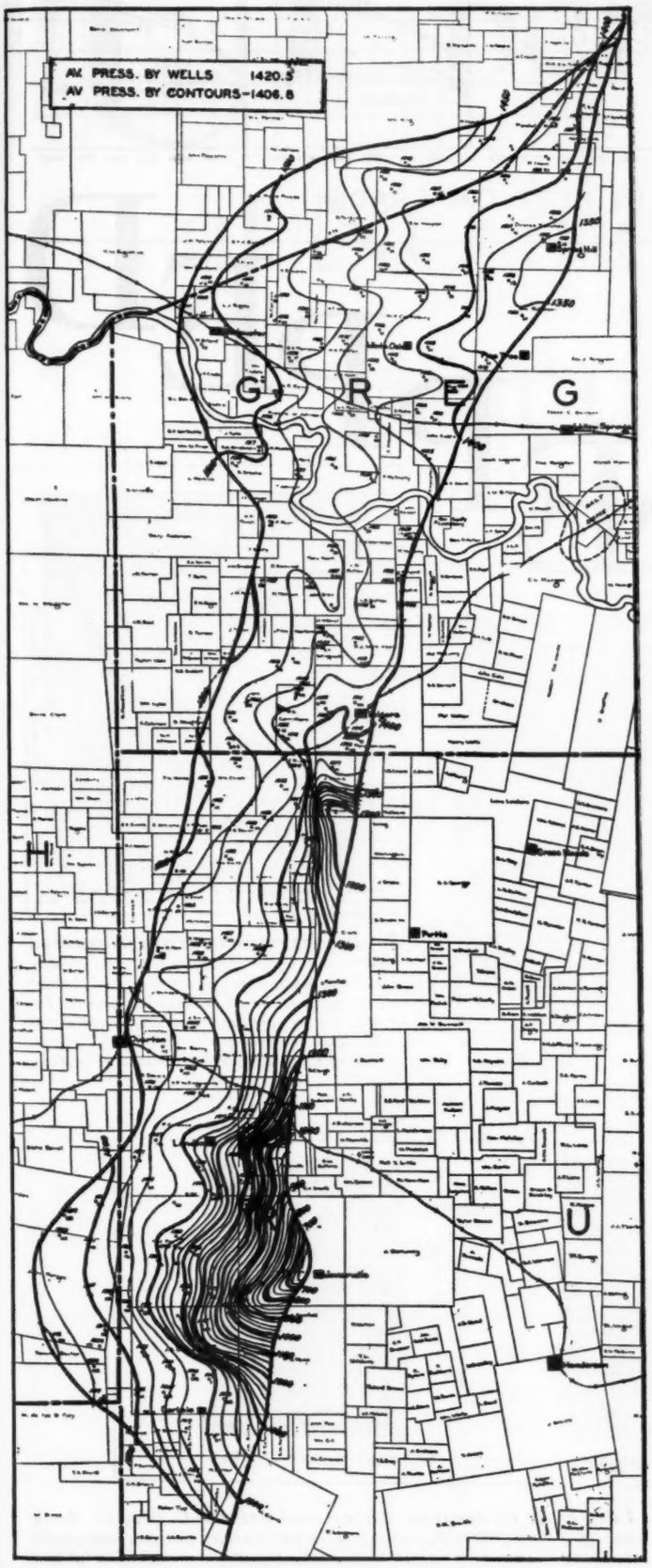
AMERADA PETROLEUM CORP.
TIDAL OIL CO.

ATLANTIC OIL & PRODUCTION CO.
BARNSDALL OIL CO.

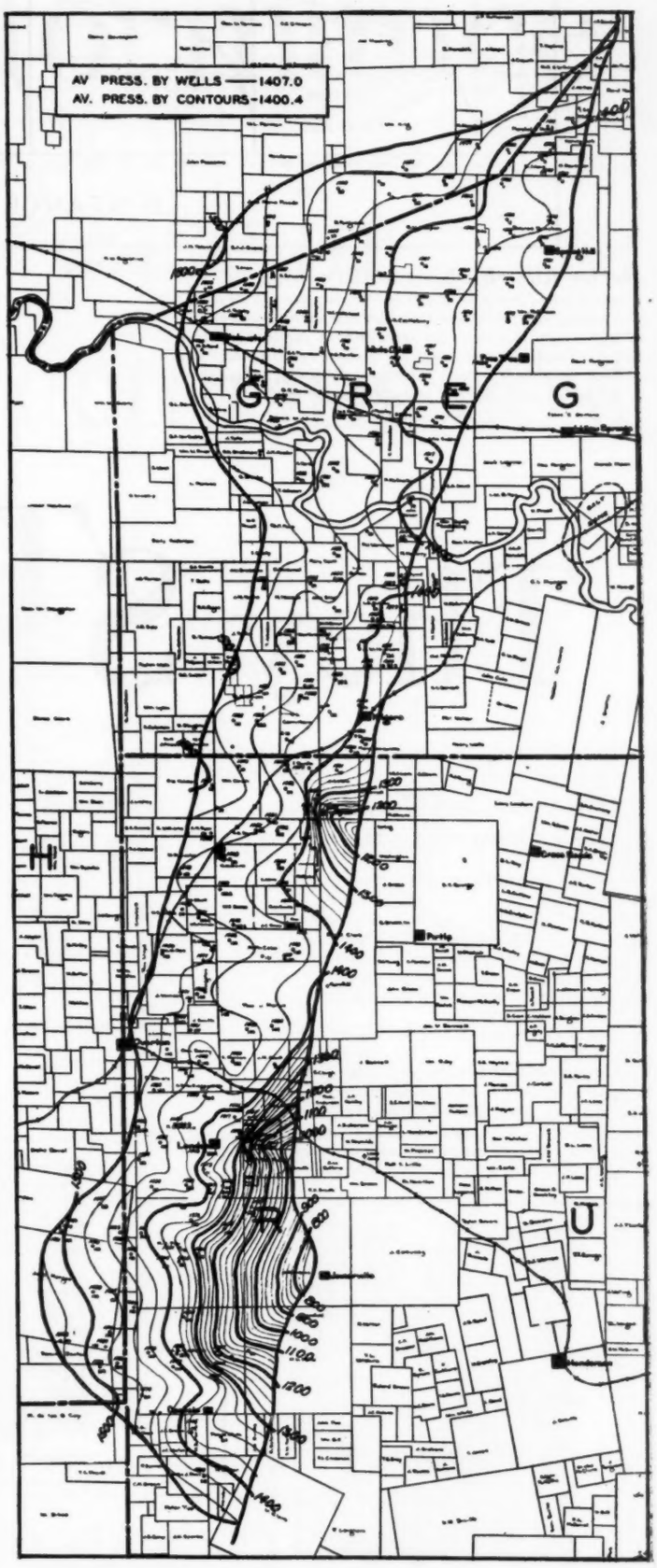
PLATS OF THE EAST TEXAS FIELD

–3300 FEET DATUM

JUNE, 1932



AUGUST, 1932

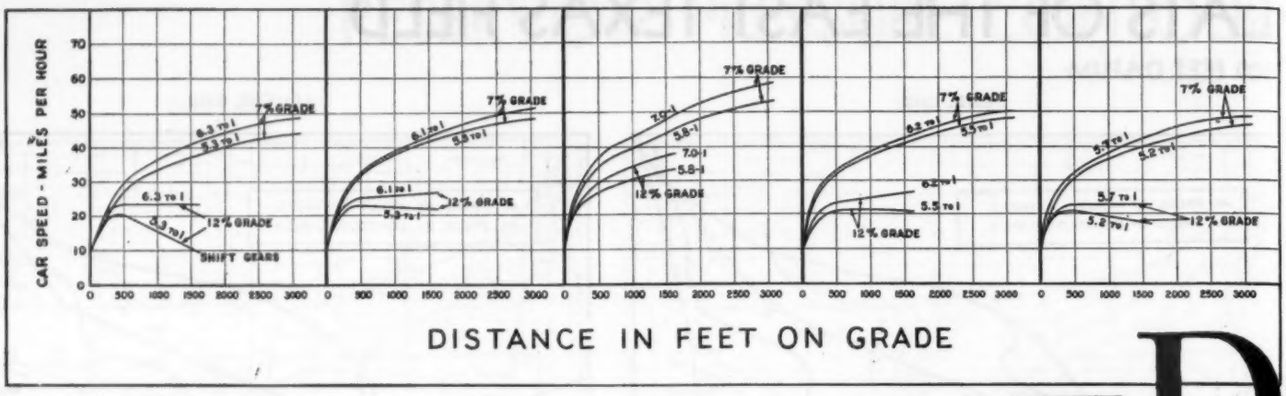


ATION OF THE FOLLOWING COMPANIES

SUN OIL CO.
SHELL PETROLEUM CORP.

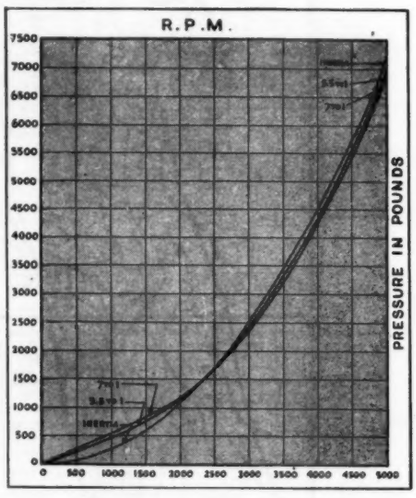
MID-KANSAS OIL & GAS CO.
STANOLIND OIL & GAS CO.

ARKANSAS FUEL OIL CO.
SINCLAIR PRAIRIE OIL CO.

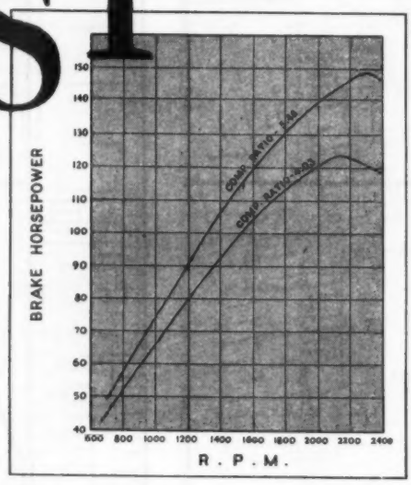


Better hill-climbing ability—*records of hill-climbing tests for five 1932 production cars are plotted above, comparing their performance with low compression ratio to that of high compression ratio. Car speed in miles per hour is shown in vertical scale. Distance up grade is shown in horizontal scale. All tests were made in high gear with cars moving ten miles an hour from a point a few feet preceding start of grade.*

They STEPPED



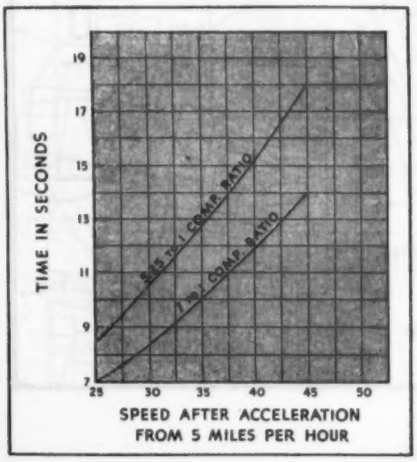
Lower extreme bearing pressures (ABOVE). *At higher speeds, the forces of inertia on crank pin bearings are greater than, and opposed to, the gas pressure in combustion chambers. Increased gas pressure therefore lowers the mean resulting load on crank pin bearings at high speeds. At low speeds, crank pin loads present no problem.*

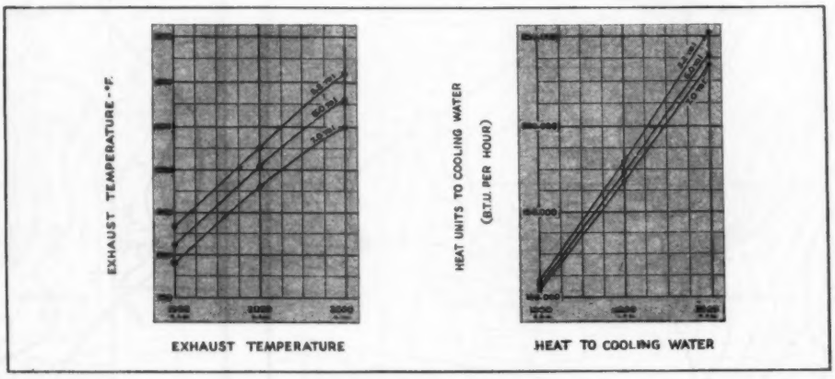


Other Gains Offered by High Compression Are:

Greater power—(RIGHT). *Many tests with passenger car engines prove that increasing compression ratio from 5-to-1 to 7-to-1 increases power approximately 15% at any given speed and steps up top speed 4 to 6 miles per hour. The chart at the right shows the gain in horsepower effected by increasing compression of a large bore truck engine.*

Faster acceleration—(BELOW). *With 5.25-to-1 compression ratio a given car (not one of those included in above hill-climbing tests) accelerated from 5 miles per hour to 45 m.p.h. in 18 seconds. With 7-to-1 compression ratio the same car reached 45 miles per hour in approximately 14 seconds.*





Less heat to cooling water and exhaust—(ABOVE). *By a more efficient use of the fuel energy, higher compression ratios maintain cooler engine temperatures at any given r.p.m. The lower exhaust gas temperatures impose less heat on exhaust valves and transmit less heat to the driving compartment in hot weather. Less heat transmitted to cooling water by higher compression engines offers relief to overloaded radiators in your new, more powerful models, rather than a further strain.*

UP performance ... at NO increase in manufacturing cost

Improvements resulting from major increases in compression ratio are already being demonstrated by production cars on the road

THERE ARE 1932 cars in all price classes now delivering performance that can be produced only by high compression engines.

The results of hill-climbing tests on five such cars at high and low compression ratios are shown by the curves at the top of the opposite page. These cars vary widely in price, in permissible compression ratio, and in actual performance figures. In every case the increase in compression ratio provided performance gains that add greatly to the car value.

On some of these cars, high compression ratio is standard; on others it is offered at the purchaser's option. Most of the cars having standard high compression also offer an optional lower ratio, although few buyers to whom the high compression car is demonstrated are satisfied with the decreased performance of low compression.

Other benefits of increased compression, higher peak power engine speed, faster car acceleration, less heat to cooling water, lower exhaust gas temperatures, and lower extreme bearing loads, are illustrated by the remaining charts. The fact that realizing these various advantages involves no costly redesigning or retooling is of importance to which attention need hardly be directed.

High compression production cars, driven by enthusiastic owners, are now setting the standards of performance by which the car-buying public will judge 1933 cars. Will your 1933 car take advantage of the compression made possible by Ethyl Gasoline to get the kind of performance that will win more sales next year?

Engineers of the Ethyl Gasoline Corporation have had wide experience with high compression engines. They will be glad to cooperate with you in the development of high compression for your new model. Ethyl Gasoline Corporation, Chrysler Building, New York City, N. Y.

to East Texas, in which all gas is in solution in the reservoir, is completely unsound and without reason. It is impossible to predict the nature of pressure decline in such fields for at present no method is available for evaluating the pressure maintenance of a water drive as the differential pressure in the formation varies. Further, there is no manner in which to foretell the effect of gas energy on the reservoir pressure when such a pressure is reached that dissolved gas begins to come out of solution in the formation. Certainly, common thought among engineers is that "Utopia" will be reached when such a time comes that water drive fields are produced at such a rate as to allow the water encroachment to keep pace with the rate of extraction, thereby affecting and maintaining a constant reservoir pressure. Obviously, if such thought is valid, the estimated ultimate production under such conditions would be infinite, thus proving the fallacy of this method of estimating ultimate recovery from water drive fields.

It is believed, however, entirely possible that sooner or later subsurface pressures will be used in estimating ultimate recovery from oil reservoirs. It should be possible, by correlating subsurface information to develop a method for analyzing and comparing these data in such manner as to arrive at a reasonably close estimate of reserves. Like other methods, this of course would not be infallible. It should be particularly well adapted to natural flowing fields similar to East Texas in which the boundaries are defined early in the development. Further it should be superior to other methods in that the subsurface pressure data would supply us for the first time with tangible information in which all the indeterminates of reservoir characteristics would be reflected. The practical development and application of such a method should prove a valuable contribution to the study of reservoir capacities and ultimate production.

Reservoir Pressure Decline

A definite means for observing the nature and trend of reservoir pressure decline is rendered through the use of subsurface pressures. It has been previously brought out that no dependable relationship exists between reservoir pressure decline and the rate of extraction from a pool. Therefore, the only method for obtaining this information is through actual tests. If a sufficient number of tests are taken over a pool, pressure contour plats may be drawn.

The accompanying chart shows an assembly of several of these plats. If the area between the corresponding contour lines on each of the plats is filled in with colors, each representing a different pressure area, it is possible to note at a glance the various changes taking place in the reservoir pressure. A clear, detailed discussion of the use and interpretation of pressure contour maps has been given by Dr. H. D. Wilde, Jr.[4]

Bottom Hole Pressures Relative to Proration

Much has been written during the past year or two on the use of bottom hole pressures as a guide for equitably prorating restricted fields. Nothing can be added to the subject in so short a space as its study is a complicated subject in itself. Suffice to say that the proposed plans appear to have merit and the outcome of their practical application will be interesting.

Application to Individual Wells

Considerable comment has been published on the application of subsurface pressures to the study of oil reservoirs. As yet, little has been said relative to their application in studying the mechanics and thermodynamics of oil and gas flow in well bores. The writer feels that this subject presents one of the most interesting possibilities in the field of study and research in applying subsurface pressures. Probably attention has been diverted from this work partially due to economic conditions and partially to the immediate need for all possible information and assistance relative to the problems of proration and unitization. The two divisions of application of subsurface pressures somewhat overlap in that the method for analyzing and comparing formation characteristics in individual wells and leases is identical to that for an entire reservoir. However, the study of pressures in flow columns is separate from the rest and remains within itself a distinct part of the subject of subsurface pressure applications.

Undoubtedly, it has been noted that the pressures used in studying reservoirs are mostly pressures confined to the bottom of the hole, such as, bottom hole pressure, bottom hole flowing pressure, differential pressure, etc. This is not the case for flow column studies as it is the correlation of all the pressures from the top to the bottom of the hole and the construction of pressure gradient curves that, so to speak, tell the story. Thus, it is believed an examination into this field of application is best conducted through a study of graphic representations of actual tests. Therefore, let us analyze a few charts and observe the manner in which the curves portray certain definite conditions. It is surprising to note how directly and unquestionably conclusions can be drawn.

By referring back to Figure 1, an illustration is seen of an actual test performed on an East Texas well. The static gradient indicates the well to be of the semiartesian type, in as much as the pressure is insufficient to raise the column of oil to the top of the hole. By projecting the static oil column gradient downwards, the point at which the curve crosses the horizontal axis would indicate the height in the tubing to which oil could be sustained by the existing formation pressure, if the gas on top of the oil column were released. As previously mentioned, the gravity of the oil may be calculated from the static gradient. If any appreciable amount of water happened to be present at the bottom of the hole it would be immediately reflected by showing a curve of even greater slope than that for the oil column. This apparently unimportant feature is already proving of value in East Texas. It is possible under

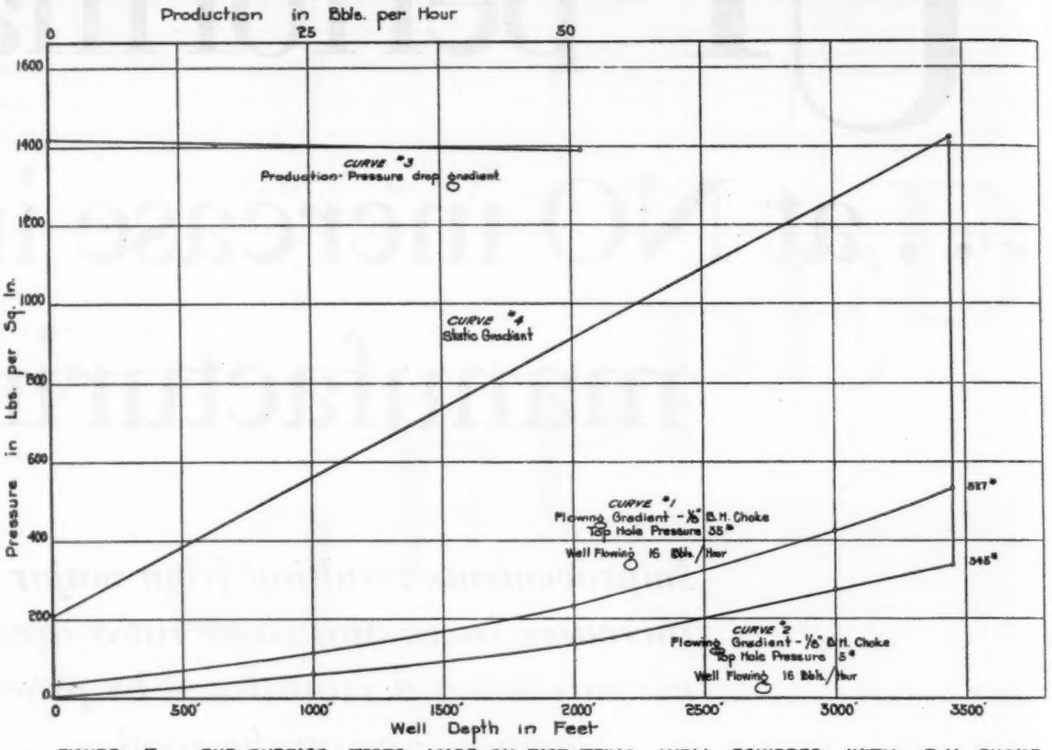


FIGURE - 3 - SUB-SURFACE TESTS MADE ON EAST TEXAS WELL EQUIPPED WITH B.H. CHOKE

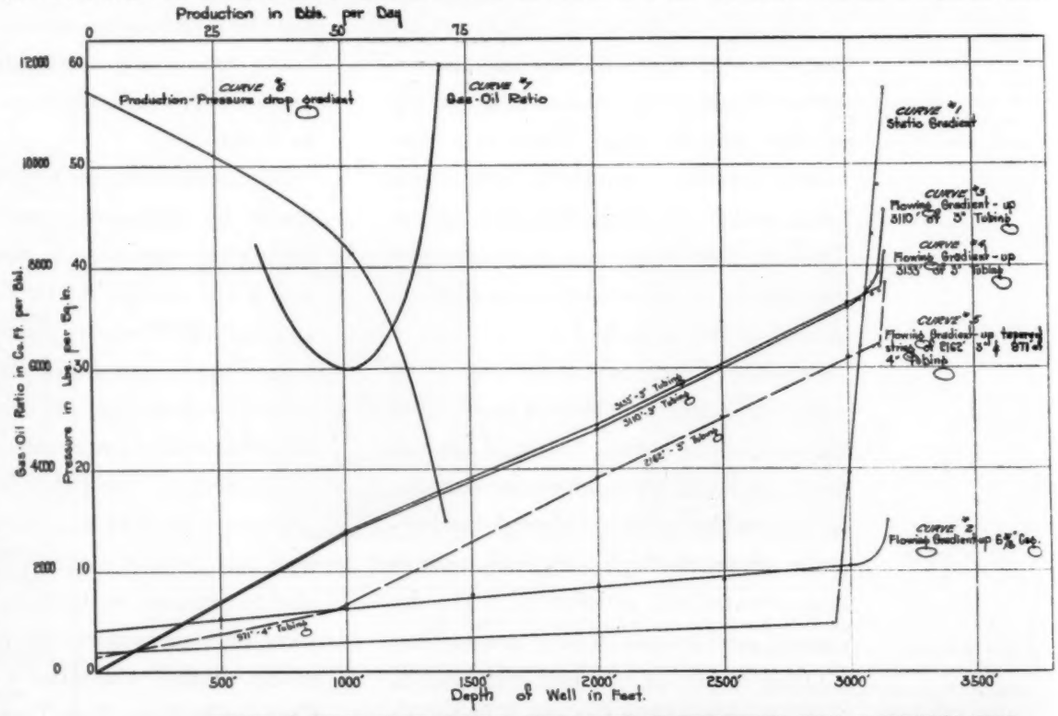
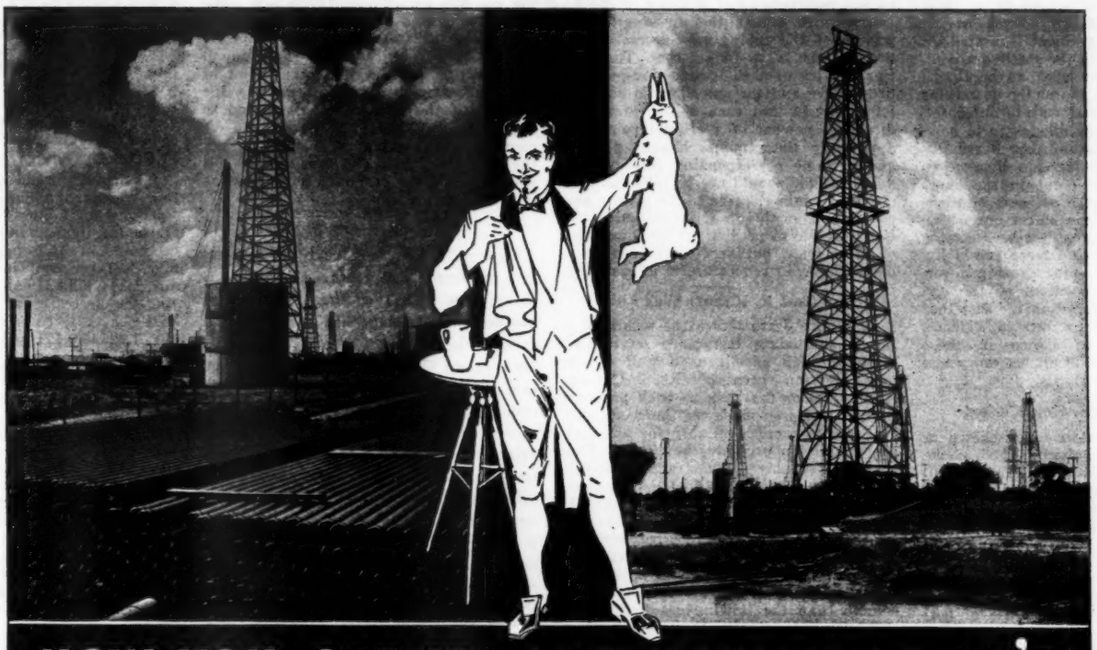


FIGURE - 4 - SERIES OF SUB-SURFACE TESTS MADE ON EXPERIMENTAL WELL IN SEMINOLE FIELD

[4]H. D. Wilde, Jr.—"Why Measure Bottom-hole Pressures?", A.P.I. mid-year meeting, Tulsa, Okla., June 2, 1932.



NOW YOU SEE IT - AND NOW YOU DON'T

No sleight of hand—just 6400 feet of Republic Electric Weld Tubing, 2½ inch, external upset, shown on the ground in the first photograph of Miniepage No. 4 well. In the other view the tubing has been run in the well to everybody's complete satisfaction.

When you think in terms of the highest quality tubing that money can buy, think of Republic Electric Weld Pipe and judge it by these qualities. It's straight . . . it's round . . . its wall is of uniform thickness . . . its weld is as strong as the wall . . . and it is clean inside and outside. It can be supplied in steel or Toncan Iron, in all the required sizes, plain or upset.

Now look at the photograph again. Have you ever seen a run of pipe as straight and as true as the one shown here. Not the slightest visible deviation in a single length. And such pipe is made possible only by the electric welding process patented by Republic.

REPUBLIC

ELECTRIC WELD

CASING
TUBING
LINE PIPE

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES: YOUNGSTOWN, OHIO

certain conditions for wells to have formation water in the bottom of the hole and yet produce 100 per cent oil. Pressure bombs are continuously detecting wells of this type which were previously thought to have no water.

The flowing gradient in this same figure is of interest in that through it several theories are substantiated. Note that for a distance of nearly a thousand feet up from the bottom of the tubing the flowing gradient is a straight line and is parallel to the static gradient. The gradient is then seen to break off into a curve with a gradually decreasing slope. The only logical way of interpreting this curve is that all gas is in solution in the formation and that it remains in solution for a considerable distance up the tubing. When a point in the curve is reached at which the pressure approximates 700 pounds, gas starts out of solution. As the pressure decreases coming up the tubing more and more gas is liberated from solution thus causing a corresponding lightening effect of the column. Emphasis is placed on the fact that this chart represents no mere coincidence, for the conditions as shown in these curves are duplicated in almost every test performed in the field.

Effect of Bottom Hole Chokes

An interesting experiment is shown in Figure 3, in which a bottom hole choke has been placed in an East Texas well. The curve itself is virtually self-explanatory, but accompanying this pressure data are some interesting occurrences worthy of mention. Although the paraffin situation in East Texas is not serious because at present it is so readily controlled, nevertheless, it is very prevalent. One's first thought relative to the use of bottom hole chokes in such a field is that due to the obvious liberation of more dissolved gas at the bottom of the hole, a greater cooling effect will occur, thus greatly aggravating paraffin deposition. Strangely enough, this analysis is wrong as actual occurrences are just the reverse. True enough, gas is liberated immediately on top of the choke as seen from the flow gradients. We know from our solubility analysis that for the existing pressure this must be small, probably being only 15 to 20 per cent of the gas in solution. What concentrated cooling occurs on top of the choke is immediately offset by the reheating effect of the hot oil surrounding the tubing. It is possible to visualize this reheating effect occurring most of the way up the tubing as more and more gas is liberated and expanded. Thus, in as much as the average flowing temperature with and without the choke will be only slightly different, what actually happens is a greatly diminished occurrence of paraffin due to more gas being out of solution, thereby causing a much greater velocity in the flow column. Further, from the experiment an idea is obtained as to the minimum pressure required to flow the average East Texas well. The figure heretofore accepted as the final flowing pressure has been in the neighborhood of 700 or 800 pounds. This figure appears rather high as from the above tests it would seem reasonable to expect flow to continue until the bottom hole pressure has dropped to at least 300 to 400 pounds. This should be of considerable interest to those companies operating in the field as it means an even greater flowing life of the wells than heretofore anticipated. From the tests it is possible to discuss the advantages and disadvantages of bottom hole chokes, but limited space prohibits such discussion.

Seminole Field Test

A series of experiments were conducted on a Seminole well for the purpose of studying the nature of oil and gas flow in various types and sizes of columns. The results are shown graphically in Figure 4. Attention is called to the extremely low bottom hole pressure of 14.8 pounds while producing through the 6⅝-inch casing. Curves 3 and 4 show the well flowing through 3-inch tubing set at different levels. The nature of the break in the curves at the bottom of the tubing is interesting. With the tubing set at 3,110 feet, the gradient shows an oil-gas mixture coming up the hole and approaching the bottom of the tubing, while with the tubing set at 3,133 feet the break in the curve is sharp, thus indicating a condition of gas entering the tubing and picking oil off the top of a more or less solid column. Curve 5 is a flow column gradient for a tapered string of tubing. Due to the replacement of 971 feet of 3-inch tubing with 4-inch, the pressure at the bottom of the tubing was decreased approximately 16 to 18 per cent. The relationship between the production-pressure drop curve and the gas-oil ratio curve is important in that each of the curves indicates somewhat of a critical point and apparently these points closely coincide at the same corresponding rate of production. This should not be taken as conclusive as data relative to the nature and correlation of these curves is limited. It is impossible to predict the final outcome of these tests, but needless to say, it is hoped they will render useful information.

Test in Kansas Well

In Figure 5 are shown the results of a recent subsurface test made on a high pressure, high gas-oil ratio well in the new Burrton area of Reno County, Kansas. In as much as no back pressure control test was made on the well, only two points were available for drawing the production pressure drop curve. This curve is probably not a straight line but more likely takes a trend somewhat similar to that shown by Curve 6, Figure 4. A peculiar condition is observed by noting the difference in slope between the static gradient and the flowing gradient. The static gradient is seen to be heavier and have a greater pressure drop in the column than the flowing gradient. With the exception of the East Texas type wells, it is believed this condition will occur only in wells having high gas-oil ratios and high reservoir pressures. Another interesting occurrence is shown by the flowing gradient in that while the well is producing at the rate of 12,000,000 cubic feet of gas and 180 bbls. of fluid per day, a pocket of fluid exists at the bottom of the hole. This clearly indicates the separation of oil and gas in the formation. At a depth of 3,327 feet the well tested 6,000,000 cubic feet of gas and no fluid. After deepening the well to a total depth of 3,390 feet and allowing it to produce for a few days, it tested 12,000,000 cubic feet of gas and 180 bbls. of fluid. It was at first thought that more gas as well as the fluid had been encountered. However, the flowing gradient disproves this theory, in that certainly no fluid could remain at the bottom of the well if the additional 6,000,000 cubic feet of gas were being produced with the oil. This lends credence to the belief that the first test was made too soon after cleaning out the rotary mud. Evidently some of the mud and water remained in the formation, thus holding back approximately 50 per cent of the well's potential gas production. This singular bit of information might prove of great value in that, if the formation were found to be lenticular it should be possible to cement the last string of casing through the gas zone, drill and produce the oil and conserve the gas until such time as it is needed.

Summary

General impression regarding subsurface pressures and their field of application has been somewhat narrow and confined. An attempt has been made to correct this impression and portray to some extent the value and importance of this study. Certainly, no recent development in production engineering has opened so wide a field for research. Although at present our fund of knowledge is extremely small regarding the intricacies of subsurface pressures and their application it is nevertheless sufficient to clearly indicate the tremendous scope of their usefulness both in practical and theoretical work. Undoubtedly, in the near future subsurface pressures will be regarded as an indispensable part of production engineering.

CALIFORNIA GAS HEARING

LOS ANGELES, Calif., Oct. 1.—Hearing on California Railroad Commission's investigation into natural gas rates of Southern California Gas Co. was adjourned until October 11.

KANSAS GAS HEARING

TOPEKA, Kans., Oct. 3.—The three-judge Federal court will consider the reasonableness of the 40-cent gate rate contract at hearings which will begin October 25.

Government Report Shows Effect of Price Declines

The products of petroleum refineries were valued at $1,511,597,675 in 1931, a decrease of 42.7 per cent as compared with the 1929 total of $2,639,665,001, according to information from the census of manufactures made available last week by the Department of Commerce.

Gasoline is the most important refinery product, it was pointed out, the 1931 output amounting to 16,957,806,559 gallons, worth $824,659,791, a decrease of only 3.3 per cent in quantity from the 17,538,788,709 gallons produced in 1929, but a drop of 46.1 per cent in value from the $1,531,242,047 reported two years earlier.

Important products other than gasoline which contributed to the total for 1931 are as follows: Fuel oils, 13,855,860,509 gallons, valued at $265,719,924, decreases of 15.5 per cent in quantity and 30.9 per cent in value; lubricating oils, 1,141,353,621 gallons valued at $196,190,766, decreases of 26.5 per cent and 35.6 per cent, respectively; illuminating oils, 1,729,669,421 gallons, valued at $72,146,477, decreases of 26 per cent and 56.2 per cent, respectively.

In addition, considerable quantities of lubricating oils and greases are made, mainly from materials purchased from petroleum refineries, by establishments classified in other industries, particularly the "lubricating oils and greases, not made in petroleum refineries" industry. The values of lubricating oils and greases thus made outside the petroleum refining industry in 1929 amounted to $48,418,926 and $18,683,143, respectively. The corresponding figures for 1931 are not available at this time, but will be given in the final report.

The cost of materials, containers for products, fuel, and purchased electric energy was $1,200,918,204 in 1931, 40.9 per cent less than in 1929, while the value added by manufacture last year amounted to $310,679,471, which was 48.9 per cent below the figure for 1929.

CARL GIBONEY DIES

LOS ANGELES, Calif., Oct. 1.—Carl L. Giboney, superintendent for the Associated Oil Co. in the Coalinga-Kettleman area for the past 20 years, died last week following his return to his Coalinga residence after a brief vacation.

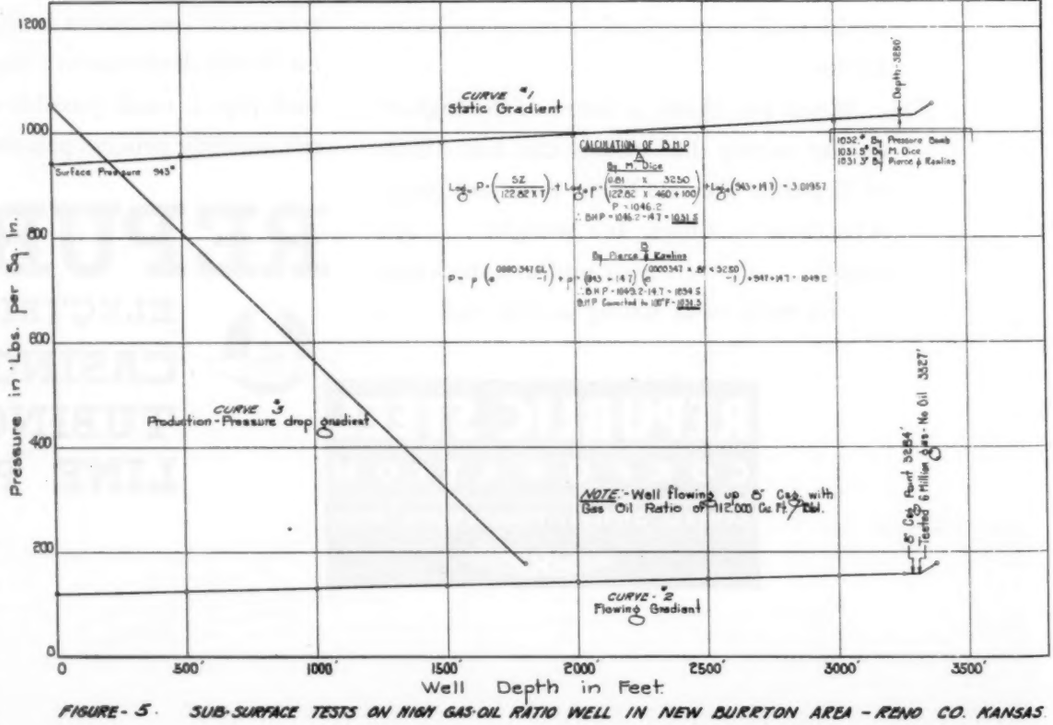
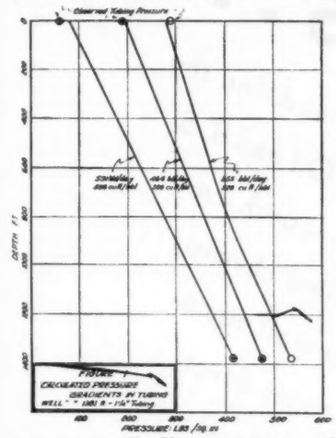


FIGURE-5. SUB-SURFACE TESTS ON HIGH GAS-OIL RATIO WELL IN NEW BURRTON AREA - RENO CO. KANSAS

New Hypothesis Developed for Calculation of Pressure Drops in Actual Flowing Wells

By T. V. MOORE and R. J. SCHILTHUIS
Production Research Department, Humble Oil & Refining Co.*

In a previous paper[1] the results of some experimental work on the measurement of slippage in the flow of oil and gas mixtures through vertical pipes were presented. The data obtained were correlated and equations were deduced from which the performance of the experimental gas lift could be predicted with reasonable accuracy. However, attempts to apply the equations to the calculation of pressure drops in actual flowing wells yielded erroneous results. At the time the results of the experimental work were published, no satisfactory explanation could be offered for the failure of the empirical equations to express properly the performance of wells. However, recent work has led to the development of a new hypothesis which presupposes certain conditions affecting the flow of oil and gas in wells. When the proposed equations are corrected to allow for these conditions, an agreement between the observed and calculated performance of the actual wells is obtained which in most cases is quite satisfactory, although it is subject to certain limitations. In this paper, the method of calculating the pressure drop in actual wells is considered, and the application of the method suggested to the design of tubing is discussed.



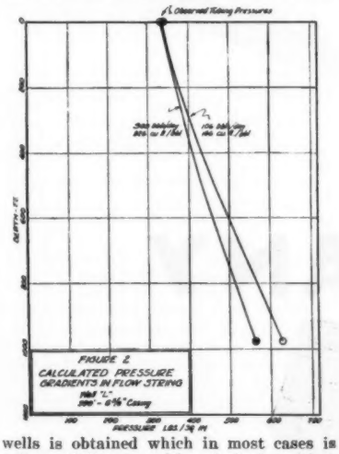


TABLE 1—NOMENCLATURE

Symbol	Definition	Units
H	Length of pipe	Feet
D	Pipe diameter	Inches
A	Area of pipe	Square feet
L	Rate of liquid flow	Cubic feet per minute
L_F	Rate of foam flow	Cubic feet per minute
G	Rate of free gas flow	Cubic feet per minute at standard conditions
G'	Rate of free gas flow	Cubic feet per minute corrected to average pipe pressure and temperature
ρL	Density of liquid	Pounds per cubic foot
ρF	Density of foam	Pounds per cubic foot
ρG	Density of gas	Pounds per cubic foot
s_L	Specific gravity of liquid	Relative to water at 60° F.
s_F	Specific gravity of foam	Relative to water at 60° F.
s_G	Specific gravity of gas	Relative to water at 60° F.
z_L	Viscosity of liquid	Centipoises
z_G	Viscosity of gas	Centipoises
γ_L	Surface tension of liquid	Dynes per centimeter
u_L	Linear velocity of liquid	Feet per second
u_F	Linear velocity of foam	Feet per second
V'	Relative volume velocity between free gas and liquid or foam	Cubic feet per minute
y	Fraction of pipe occupied by liquid or foam	No units
x	Ratio of fraction of pipe occupied by liquid or foam to that occupied by gas	No units
P_B	Pressure at bottom of pipe	Pounds per square inch absolute
P_T	Pressure at top of pipe	Pounds per square inch absolute
P_{av}	Average pressure in pipe	Pounds per square inch absolute
P_{at}	Atmospheric pressure	Pounds per square inch absolute
ΔP	Total pressure drop	Pounds per square inch
ΔP_L	Pressure drop due to hydrostatic head of liquid or foam	Pounds per square inch
ΔP_{Fr}	Pressure drop due to friction	Pounds per square inch
K	Henry's Law constant	Cubic feet gas dissolved per cubic foot liquid per pound per square inch
g	Gravitational constant	Feet per second per second

Principal Factors

At the outset, a few of the principal factors affecting slippage and efficiency in the gas lift discussed in the previous paper will be reviewed. In the flow of a mixture of oil and gas in a vertical pipe, slippage is the phenomenon of gas moving upward with a linear velocity greater than that of the oil. Under steady conditions, if given quantities of oil and gas enter the tubing per unit of time, the same quantities of oil and gas per unit time must, on the average, pass every section of the tubing; otherwise, there would be accumulation or depletion of the oil or gas at some sections, and the flow would be unsteady. Therefore, if the gas is to flow at a greater linear velocity than that of the liquid, the cross sectional area through which it passes must be reduced, and the cross sectional area through which the liquid passes must be increased as compared to the areas prevailing for equal velocities. The ratio of the average cross section of the pipe occupied by liquid to that occupied by gas, and the ratio of the volume of the two phases flowing past any section in unit time affords a direct measurement of the energy lost in slippage. It was shown that the fraction of the total gas energy lost in slip in a gas lift is:

$$1 - \frac{L}{G'x}$$

(For nomenclature used in this discussion, see Table 1.) or one minus the ratio of the volumes of liquid and gas flowing per unit time divided by the ratio of the cross sectional area through which the two phases flow. Increased slip increases the fraction of the pipe occupied by the liquid, which increases the amount of the oil in the tubing, which in turn, increases the apparent density of the oil and gas mixture. This increases the hydrostatic head of the fluid mixture in the tubing and hence the total pressure drop. To lift a given quantity of oil, the gas

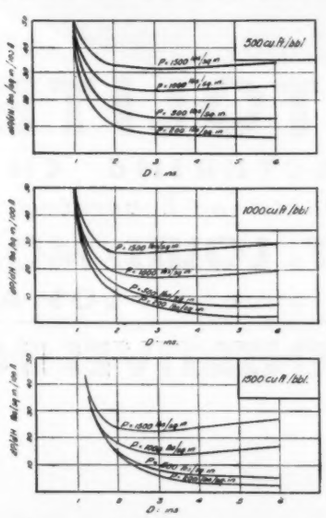

PRESSURE GRADIENT ASSUMING STABLE FOAM
PROBABLE ACTUAL PRESSURE GRADIENT
PRESSURE GRADIENT ASSUMING NO FOAM
FIGURE 3
EFFECT OF INSTABILITY OF FOAM ON PRESSURE DROP IN TUBING
DEPTH FT.
PRESSURE: LBS. PER SQ. IN.

Figure 4—1000 bbls. 1 day; 1500 lbs. reservoir pressure

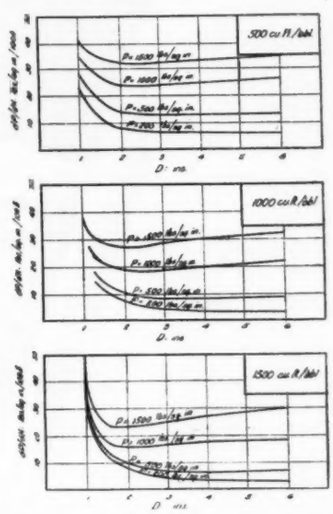


Figure 5—500 bbls. 1 day; 1500 lbs. reservoir pressure

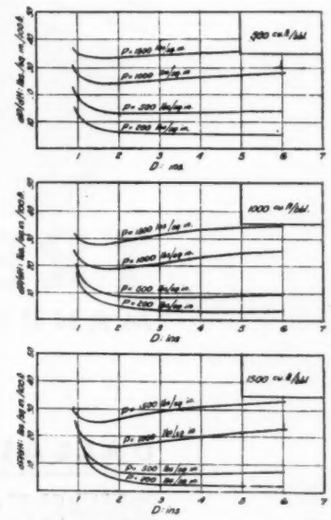


Figure 6—200 bbls. 1 day; 1500 lbs. reservoir pressure

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

[1]Experimental Measurement of Slippage in Flow Through Vertical Pipes, H. D. Wilde, Jr., and T. V. Moore, Transactions of A.I.M. & M.E., 1931, p. 296.

TRET-O-LITE

Process Patented — Reg. U. S. Patent Office

LOWER TREATING COSTS . . .

have been obtained for the treatment of Cut Oil and B. S. by constant research conducted by skilled chemists in these large well equipped laboratories devoted exclusively to this work.

TRETOLITE COMPANY

MANUFACTURING CHEMISTS

Plants and Laboratories

ST. LOUIS, MO.

DALLAS • • • LOS ANGELES

T-10

REPRESENTATIVES IN ALL PRINCIPAL FIELDS

OGJ-10-6 Gray

must, therefore, expand between wider pressure limits and hence must give up more energy in order to perform the same amount of useful work. This, obviously, reduces the efficiency.

Fundamental Problem

The fundamental problem of the gas lift is to calculate the pressure drop in

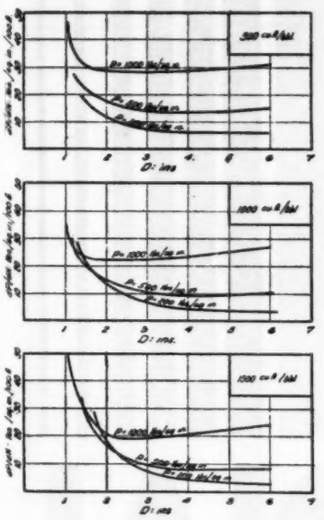


Figure 7—1000 bbls 1 day; 1000 lbs. reservoir pressure

a given flow string under a given set of conditions. The only components of major importance in ordinary work are the hydrostatic head of the fluid in the tubing and the frictional resistance. Both of

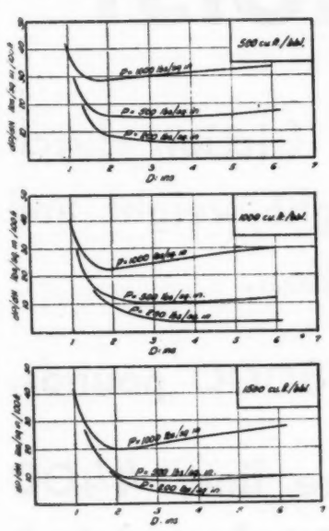


Figure 8—500 bbls. 1 day; 1000 lbs. reservoir pressure

these components depend upon the fraction of the pipe occupied by the liquid phase, and hence the slippage is of fundamental importance. The experimental work has shown that the ratio of the cross section occupied by liquid to that occupied by gas depends upon the relative volume velocity of the gas past the oil, the pipe diameter, the density of the liquid, and the surface tension of the liquid. The equation expressing the relationship was found to be:

$$x = \frac{3.58\, D^{1.167}\, s_L^{2.33}}{V'^{0.67}\, \gamma_L^{0.275}} \qquad (1)$$

V′, the relative volume velocity, depends upon the quantities of liquid and gas flowing, and x, the relationship being:

$$V' = G' - \frac{L}{x} \qquad (2)$$

It is apparent that Equations 1 and 2 must be solved for x by trial and error. A value of x is assumed and substituted in 2 in order to determine V′. This value of V′ is used in the solution of 1 for x. The calculations are repeated until the assumed and estimated values of x agree. G′ is the volume of free gas under average pipe conditions, and where the gas

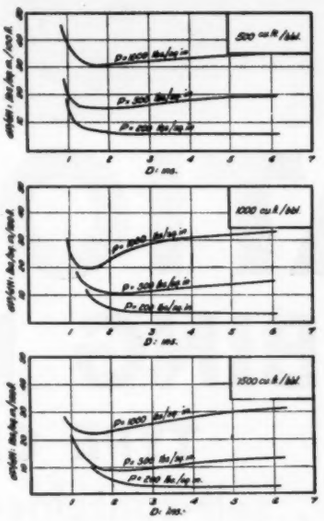


Figure 9—200 bbls. 1 day; 1000 lbs. reservoir pressure

bubbles evolve from the liquid without forming a froth, this quantity is given by the equation:

$$G' = \frac{GP_{at}}{P} - KP_{at}L \qquad (3)$$

Having determined x, the fraction of the pipe occupied by liquid is then determined:

$$y = \frac{x}{1+x} \qquad (4)$$

and the hydrostatic head of the liquid is calculated by the formula:

$$\Delta P_L = y\, \rho_L(\Delta H) \qquad (5)$$

The empirical Equation 1 used in calculating x is subject to the criticism that it is not dimensionally sound. Nevertheless, the equation was deduced from work on a wide variety of liquids, but on only one gas; hence, the effect of the properties of the gas are not apparent. By arbitrarily assuming the manner in which the properties of the gas do affect this relationship, we may put it into a form which is dimensionally sound:

$$x = C\left(\frac{V'^2\, s_L}{D\, \gamma_L}\right)^{0.275}\left(\frac{D\, z_g}{V'\, s_g}\right)^{1.83}\left(\frac{D^{4/3}}{gV'}\right)^{0.167}\left(\frac{s_L}{s_g}\right)^{0.833} \qquad (6)$$

Future experimental work should reveal whether the properties of the gas do affect the relationship in this manner, but it would seem that putting the equation on a dimensionally sound basis would enhance its theoretical significance. In all of this work, however, the simpler empirical equation was used.

Estimating Friction

Having determined the hydrostatic head, the friction must be estimated. The empirical equation obtained from the experimental data was:

$$\Delta P_{Fr} = 0.0125\,\frac{u_L s_L{}^2 z_L{}^{0.15}}{D} \qquad (7)$$

This was later modified in order to obtain better agreement with field data to:

$$\Delta P_{Fr} = 0.0125\,\frac{u_L s_L z_L{}^{0.15}}{D} \qquad (8)$$

This equation will approximate the Fanning equation quite closely if suitable values for the friction factor are selected. The writers do not believe that the viscosity of a mixture of oil and gas has any significance; hence, the viscosity is that of the pure liquid.

In the experimental work, it was very difficult to determine the friction accurately, but it is believed that the data taken were sufficiently accurate to show that the fraction varied inversely as the diameter, that the influence of the viscosity of the liquid was small, that the liquid density did have considerable effect, and that the fraction loss varied more nearly as the first power of the liquid velocity taken as its square. The constants in the equation may be questionable, but the results are of the right order of magnitude. The liquid velocity in feet per second is given by the equation:

$$u_L = \frac{L}{60A\gamma} \qquad (9)$$

where L is the quantity of liquid flowing in cubic feet per minute.

The total pressure drop is, for all practical purposes, the sum of the hydrostatic head and the friction. That is:

$$\Delta P = \Delta P_L + P_{Fr} \qquad (10)$$

The early attempts to apply the foregoing formulae to the calculation of the pressure drop in flowing wells gave results which were in error, although apparently each variable influenced the pressure drop in the proper manner. In all cases, it was observed that the calculated pressure drop was greater than the values observed; that is, the actual performance was more efficient than the equations would indicate.

Well Performance

With the development of methods of measuring pressures at the bottom of wells, reliable data were accumulated on actual well performance, and these data were subjected to careful analysis. One condition was frequently observed for which no clear explanation was readily apparent: a number of wells were found to have flowing efficiencies of practically 100 per cent; that is, the losses due to friction and slippage were negligible.

Further investigation revealed that all such wells were producing with very little gas in excess of that dissolved in the oil at the pressure existing at the bottom of the well, and that in practically every case of a well flowing under these conditions, the efficiency was nearly 100 per cent. This led to the following explanation for this apparently abnormal behavior: the gas coming out of solution from the oil as the pressure decreases becomes dispersed throughout the oil in

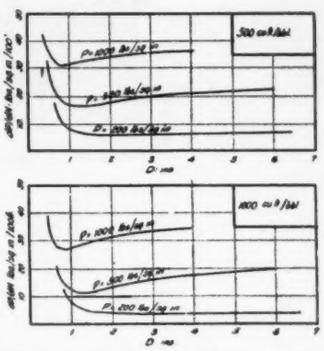


Figure 10—50 bbls 1 day; 1000 lbs. reservoir pressure

very fine bubbles, forming a stable foam, in which the gas bubbles cannot move except at very low velocities and consequently slippage is negligible. Under such conditions, and at velocities sufficiently low to permit the neglect of friction, the pressure drop may be calculated with very little error by assuming that there are no friction or slip losses.

Hypothesis Formulated

The behavior of wells which produce with only the dissolved gas has led to the formulation of the following hypothesis to explain the performance of other types of wells. It is assumed that the gas in solution evolves as the pressure decreases, but that this gas forms a stable foam, and that little of the dissolved gas escapes from the foam phase. Thus, the gas which came out of solution is prevented from slipping past the oil. The free gas, however, does slip past the oil, or rather the foam, and the amount of slippage depends upon the properties of the foam, rather than upon the properties of the liquid. In other words, the lift must be considered not one in which a liquid is raised by a quantity of gas which is constantly being increased by that which comes out of solution, but

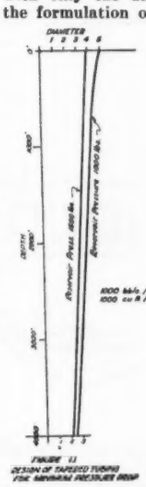
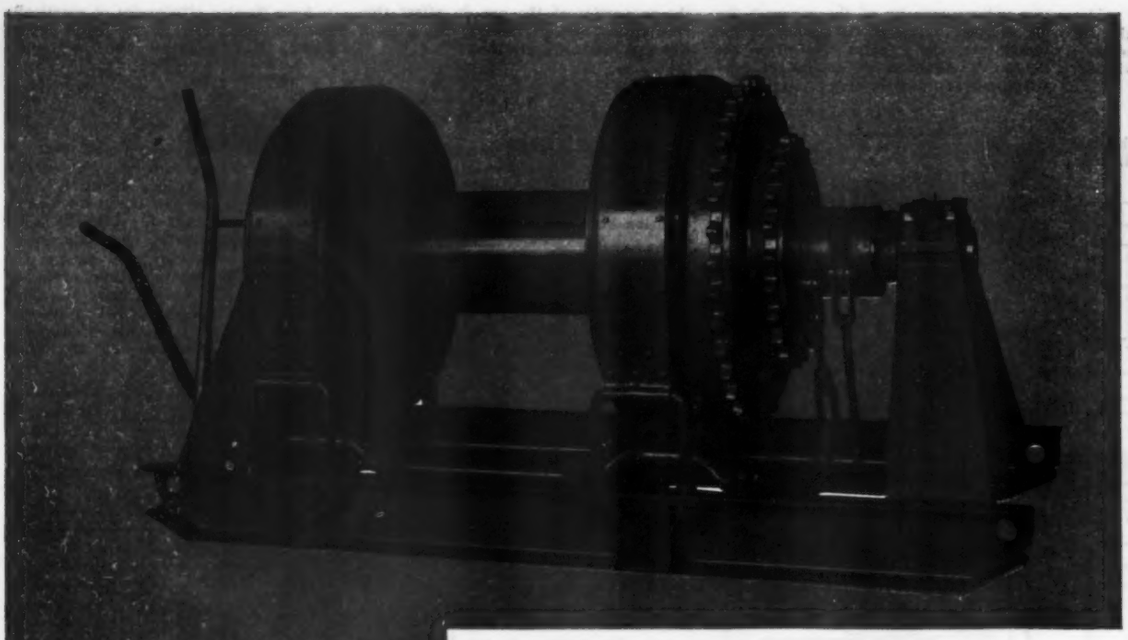


TABLE 2

Well—	Tubing diameter (inches)	Tubing length (feet)	Bbls./day	Cu. ft./bbl.	Bottom pressure Lbs./sq.in.	Top pressure Lbs./sq.in. Observed	Top pressure Lbs./sq.in. Calculated	ΔP/ΔH Lbs./sq.in./100 ft. Observed	ΔP/ΔH Lbs./sq.in./100 ft. Calculated	Error Lbs./sq.in./100 ft.	% error
A	1¼	1,381	591	556	415	60	80	25.7	24.2	—1.5	—5.8
			464	506	474	190	195	20.6	20.2	—0.4	—2.0
			355	528	536	290	280	17.8	18.5	+0.7	+3.9
B	2	3,662	398	202	1,349	330	360	27.8	27.0	—0.8	—2.9
C	2	3,606	195	531	1,327	610	590	19.9	20.4	+0.5	+2.5
D	2	1,078	12	7,080	340	235	227	9.7	11.4	+1.7	+14.9
E	2	1,077	51	980	160	45	56	10.7	9.7	—1.0	—10.0
F	2	1,074	24	2,620	185	95	105	8.0	7.5	—0.9	—10.7
G	2½	5,300	956	312	2,165	600	650	29.6	28.6	—1.0	—3.4
H	2½	4,700	1,128	950	1,945	1,065	1,055	18.7	18.5	—0.2	—1.1
I	2½	3,668	390	214	1,429	370	385	29.6	29.3	—0.3	—1.0
			78	226	1,436	420	425	28.5	28.1	—0.4	—1.4
J	3	4,172	934	731	1,275	550	569	19.8	19.3	+0.5	+2.5
			130	1,160	1,450	600	656	20.3	19.0	+1.3	+6.4
K	3	4,172	1,660	426	1,465	480	470	23.6	23.8	+0.2	+0.9
L	6⅝	990	900	326	565	338	331	22.9	23.6	+0.7	+3.1
			106	186	630	332	335	30.1	29.8	—0.3	—1.0



NATIONAL
TUBING HOIST
TYPE CF

A portable, self-contained, friction clutch unit of modern design, light weight and extremely rugged construction.

Rated line pull capacity, 18000 pounds.

Drum capacity, $\frac{3}{4}$-inch wire line, 4400 feet; $\frac{7}{8}$-inch wire line, 3250 feet; 1-inch wire line, 2500 feet.

An exceptionally strong and rigid hoist which provides ample capacity, great convenience and extreme serviceability at a moderate cost.

NSCO
"REG. U. S. PAT. OFF."

Descriptive literature free on request

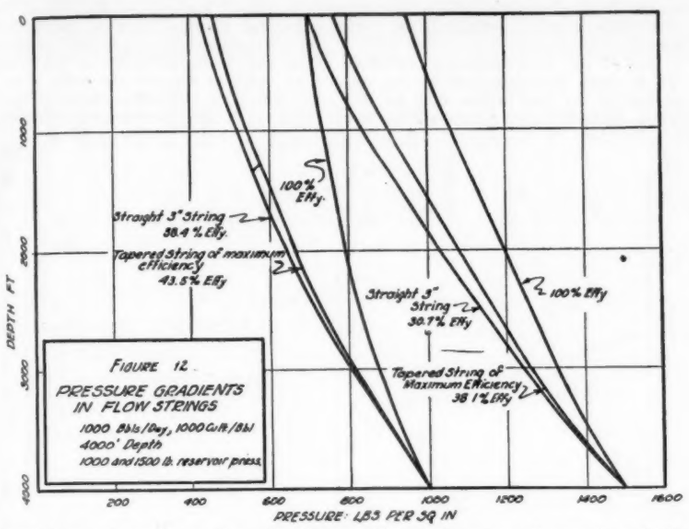
THE NATIONAL SUPPLY COMPANIES

rather as one in which a foam comprising the liquid and the gas which has come out of solution is lifted by the gas which was undissolved at the point of entrance. It seems, therefore, that the equations previously developed should hold, provided the physical properties and velocities used are considered to be those of the foam instead of the pure liquid. These properties may be readily calculated from the gas laws. In estimating the free gas volume, the following equation, rather than Equation 3, must be used:

$$G' = (G - KP_{st}L)\frac{P_{at}}{P} \qquad (11)$$

In order to check this hypothesis, the pressure drop in a number of flowing wells has been calculated. Since the pressure drop depends upon the conditions at the base of the well, it is easier to calculate the top pressures from the bottom pressures. The curves of pressures against depth are plotted, and the calculated tubing pressures are compared with the values actually observed. Figure 1 shows the results of such calculation on a well flowing through 1¼-inch tubing at three different rates of flow. Figure 2 shows similar calculations on a well flowing through 6⅝-inch casing at two different rates of flow. In Table 2 are presented the results of similar calculations on a number of wells in several different fields. It will be observed that the pressure drop calculated agrees reasonably well with the observed values, usually to within 5 per cent.

This general agreement between the observed and calculated results lends support to the fundamental hypothesis of the stable foam. However, there are certain limitations to the equations which must always be kept in mind. The first of these and the most important is the instability of the foam. Apparently, under certain conditions, the gas does separate from the foam in appreciable quantities. The evidence supporting this is that many wells, whose performance may be calculated closely when flowing at an ordinary rate, actually show higher pressure drops than those calculated at very low rates. In such cases, the observed pressure drop has always been found to be between the pressure drop calculated by assuming a completely stable foam, and again by assuming that no foam at all is formed. Figure 3 gives an example of the pressure drop in a well under these two assumed conditions compared with the values actually observed. The tendency of the gas to break out does undoubtedly influence the observed pressure drop. The factors which tend to increase the extent of separation of gas from the foam are chiefly the length of time the foam is in the tubing and the pressure on the foam. Foams of liquids having high surface tensions tend to be unstable: as the liquid is lowered, the surface tension of the liquid phase increases; hence, the stability of the foam decreases. Furthermore, the expansion of the gas bubbles tends to break the foam. Hence, the equations may be expected to fail at low velocities with long or very large flowstrings and under low pressure. Another factor which is important but which was not evaluated in the experimental work is the effect of the properties of the gas.


DEPTH FT
PRESSURE: LBS PER SQ IN
100% Effy
Straight 3" String 38.4 % Effy
Tapered String of maximum efficiency 43.5% Effy
Straight 3" String 30.7% Effy
100% Effy
Tapered String of Maximum Efficiency 38.1% Effy
FIGURE 12
PRESSURE GRADIENTS IN FLOW STRINGS
1000 Bbls/Day, 1000 Cu ft/Bbl
4000' Depth
1000 and 1500 lb. reservoir press.

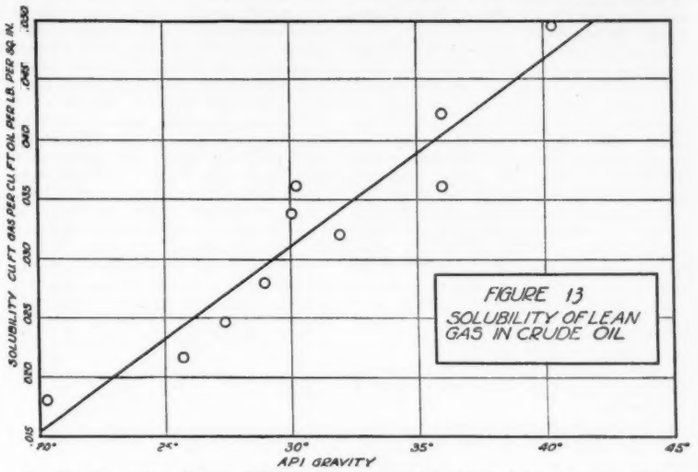
Still another source of error is undoubtedly to be found in the friction equation which may be only a rough approximation.

Sources of Error

In addition to the foregoing factors, which are inherent in the method proposed, the production of oil and gas, the solubility of the gas in the oil, the deviations from the gas laws and solution laws, and the actual diameter of the tubing, which may be altered slightly by paraffin accumulations, must be known accurately if accurate results are desired.

However, in spite of these sources of error, it is felt that reasonable accuracy can be obtained over a wide range of operating conditions. At present, it is believed that the following conditions set the approximate useful limits of the equations:

1. Production rates above 50-100 bbls. per day.



2. Gas-oil ratios below 5,000 cubic feet per barrel.

3. Tubinghead pressures above 50-100 pounds per square inch.

4. Specific gravity of gas below 0.8.

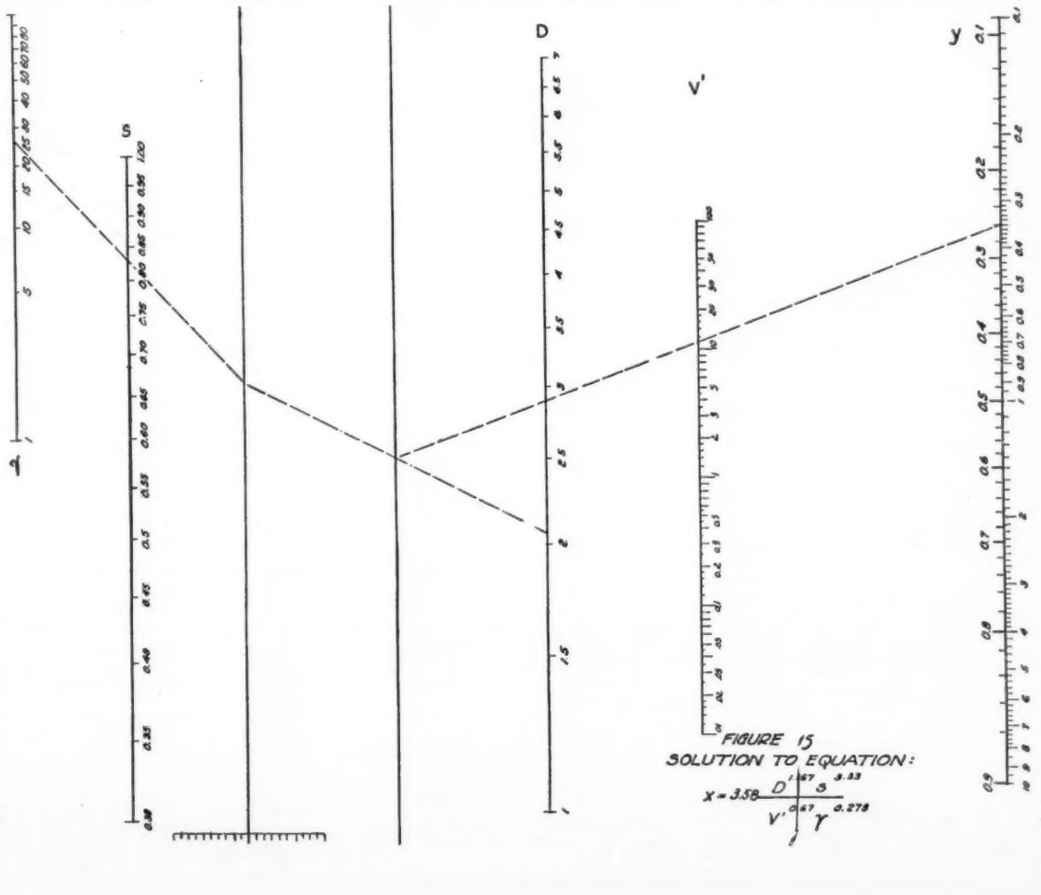
5. Calculated friction drop less than calculated hydrostatic head.

In spite of these limitations, it is felt that the equations are useful, even when they break down. For instance, at low pressures or at low rates of flow, where the equations fail because of the instability of the foam, they may be used to ascertain the limit which can be obtained.

As an illustration of the use of these equations in computing pressure drops in flowstrings of flowing wells, an example has been worked out in detail. However, to conserve space, it will not be presented here. Anyone interested may communicate with the authors, who will gladly furnish a copy of the calculations.

Practical Application

Keeping in mind the limitations of the method of calculation, the practical application will now be considered. Most problems dealing with tubing design can be readily solved if the pressure drop per unit length of pipe is known. In order to facilitate the calculation of this quantity, a series of curves showing the pressure drop under various sets of conditions have been prepared. These are presented in Figures 4 to 10. These curves are calculated for an oil having the following properties: Specific gravity, 0.875; viscosity, 10 centipoise; solubility of gas, 0.03 cubic feet gas per cubic foot oil per pound per spuare inch. The curves are drawn showing the relationship between pressure drop per unit length and pipe diameter for rates of flow of 1,000, 500, 200 and 50 bbls. per day; bottom-hole pressures of 1,000 and 1,500 pounds per square inch; average pressures of 1,500, 1,000, 500 and 200 pounds per square inch, and gas-oil ratios of 500, 1,000 and 1,500 cubic feet per



barrel. The pressure drop under any set of intermediate conditions may be obtained by interpolation. The minimum point on each curve corresponds to the pipe diameter which is most efficient for the particular set of conditions for which the curve is drawn. In as much as these curves are not greatly influenced by the properties of the oil, they can be used for the majority of oils without introducing serious error.

These curves can be used in solving problems in tubing design. This is done by first plotting the best pipe diameter (the minimum points on the curves) against the average pressure in the flowstring. Then, by plotting the reciprocal of the pressure drop per 100 feet corresponding to the best pipe diameter against pressure, a simple graphical integration leads to the construction of a curve of pressure against length. Thus, having prepared both the plot of pipe diameter versus average pressure and the plot of length versus average pressure, it is a simple matter to make a plot of best pipe diameter versus length.

Two Problems Worked Out

Two problems which have been worked out using these curves will be presented as illustrations. These are, first, to design a tapered string of tubing for a well 4,000 feet deep, making 1,000 bbls. of oil daily with a gas-oil ratio of 1,000 cubic feet per barrel, and having an operating bottom-hole pressure of 1,500 pounds per square inch; and, second, to design a tapered string for a well of the same depth, making the same quantity of oil and gas, but having an operating bottom-hole pressure of 1,000 pounds per square inch. The resulting design of flowstrings for maximum efficiency are shown in Figure 11. In the first case, where the operating bottom-hole pressure is 1,500 pounds, a string tapering from 2 to 4 inches should be used. In the second, a string tapering from 2½ to 5 inches would give the best results.

It is interesting to note that although for the utmost efficiency a flowstring with twice the diameter at the top as at the bottom is required, the improvement in efficiency over a straight string is very small.

In Figure 12 the pressures in the flowstrings are plotted against depth. For each of the two cases cited, three curves are drawn: one to show what the pressure gradient would be where there was no slippage or friction, i.e., where the flow tube was 100 per cent efficient, another to show the pressure gradient which would prevail with the most efficient tapered string, and a third illustrating the pressure drop in a string of straight 3-inch tubing for comparison with the ideal tapered string. With an operating bottom-hole pressure of 1,500 pounds, the tubing-head pressure with the tapered string would be 770 pounds compared with 700 pounds for the 3-inch string. The efficencies would be 38.1 per cent and 30.7 per cent, respectively. With an operating bottom-hole pressure of 1,000 pounds, there is even less difference between the performance of the two strings; the tapered string would have an efficiency of 43.5 per cent, and a tubing-head pressure of 460 pounds, while the straight 3-inch string would have an efficiency of 38.4 per cent and a tubing pressure of 430 pounds.

It appears from these and other similar calculations that tapered tubing, in ordinary high-pressure flowing wells, has little advantage over a straight string of tubing. Unless the high-pressure gas taken from the tubing-head is to be used in some manner, the gas energy conserved in the flowstring will be wasted at the choke, and, therefore, there is no reason for using special designs of flowstrings until the limit of the well's flowing life has almost been reached. At any rate, it seems that for almost every condition, a string of straight tubing can be selected which closely approaches the performance of a tapered string.

Unfortunately, the method outlined in this paper is not reliable at low pressures; hence, the accuracy with which it may be applied to gas-lift work and to wells which are about to go dead is questionable. Nevertheless, the formulae may be used to indicate approximately the performance of such wells.

It is believed that gas-oil ratios may be controlled to some extent by the position of the bottom of the tubing with relation to the body of the producing sand, but that the shape or size of the flowstring has no influence on the gas-oil ratios. This idea has been held by other writers,[2, 3] and seems to be substantiated by all reliable data available.

Conclusions

From the foregoing discussion, the following conclusions may be drawn:

1. Pressure drops in flowing wells may be calculated within reasonable accuracy by the proposed method.

2. The limitations of the assumptions made and formulae derived are such that the performance of low-pressure wells cannot be predicted accurately. Unfortunately, this type of well is the one in which proper design of tubing can result in the greatest benefit.

3. From curves presented herein, it is possible to design tapered tubing of maximum efficiency. However, this efficiency can be closely approached by the use of a properly selected string of straight tubing.

4. In ordinary high-pressure flowing wells, a large part of the gas energy is wasted at the choke. Hence, there is no need for a string of tubing of greater efficiency than that required to keep the well flowing steadily, unless by a system of double traps, the energy in the gas at the tubing-head is to be utilized for some purpose.

5. Gas-oil ratios cannot be controlled by the design of tubing, except in so far as they may be influenced by the position of the bottom of the tubing with respect to the producing sand.

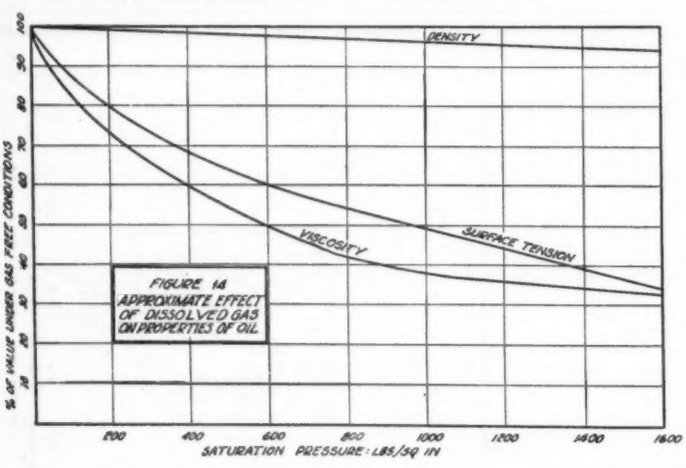


FIGURE 14
APPROXIMATE EFFECT OF DISSOLVED GAS ON PROPERTIES OF OIL

Appendix

The physical properties of the oil and gas are used in the application of the foregoing formulae. Whenever the properties have been measured for the oil and gas in question, they should be used but it is indeed rare that all the necessary data are available. In this appendix, curves from which the missing physical properties may be estimated are presented.

One of the most important variables which must be determined is the solubility of the gas in the oil. In this work, Henry's Law, which states that the gas dissolved in a liquid is proportional to its pressure, has been assumed to hold. This assumption is not necessary, but it simplified the work somewhat and, for lean gases consisting chiefly of methane and ethane, it is sufficiently exact for use in connection with these computations. For gases of high specific gravity not only Henry's Law but also the gas laws fail, and in such cases it would be necessary to know both the solubility of the gas and the volume of the undissolved gas as a function of pressure.

In Figure 13 is shown a rough relationship between the solubility of lean gas in Oklahoma and Texas oils and the gravity. This curve is based on data taken by the Humble Oil & Refining Co. as well as that of Beecher and Parkhurst[4] and Dow and Calkins.[5] Although this curve is fairly reliable for Mid-Continent and Gulf Coast oils, it is better to use the actual solubility data on the oil and gas in question whenever it is available.

Figure 14 presents curves showing roughly the reduction in density, viscosity and surface tension to be expected when gas dissolves in oil. These curves are based upon meager data and are attempts to present general relationships for all oils and all gases. Of course, such relationships are highly inexact and the curves must be regarded merely as approximations. The curve of densities was calculated. Although density is an important variable, it is not greatly altered by the dissolved gas, and, therefore, the curve drawn is probably fairly reliable.

The curve of surface tensions is based upon the data of Millikan and Swartz which has been described by Lacey.[6] The data are excellent and a fair agreement was observed between the reduction in surface tension to be expected by solution of gas and the saturation pressure for the oils on which these data are available.

The curve of viscosities, however, is by no means exact. Very few data are available and the effect of dissolved gas on viscosity varies widely with the other properties of the oil. Fortunately, the influence of viscosity of the oil on the calculated pressure drop is small, and for this reason this curve will give results sufficiently accurate for this work.

In order to simplify the work of calculation, two alignment charts for the solution of the fundamental equations are given. The first of these charts, Figure 15, solves the slippage equation:

$$x = 3.58 \frac{D^{1.167} S_P^{2.33}}{V^{*0.67} \gamma_L^{0.273}} \qquad (1)$$

and the second of these, Figure 16, solves the friction equation:

$$\Delta P_{Fr} = \frac{1.25\, u_P S_P Z_L^{0.19}}{D} \qquad (8)$$

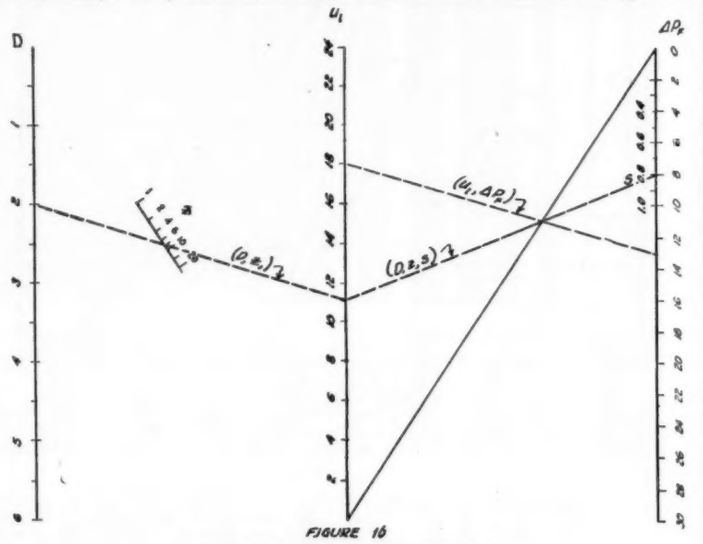


FIGURE 16
ALIGNMENT CHART FOR SOLUTION OF FRICTION EQUATION
$\Delta P_r = \frac{1.25\, u_P S_P Z_L^{0.19}}{D}$

Blending of Gasoline and Alcohol Gains in Germany

A German firm selling the German Dye Trust's synthetic gasoline has placed a motor fuel on the market which contains 78 per cent synthetic gasoline and 22 per cent alcohol, according to a report from Trade Commissioner W. T. Daugherty, Berlin, at Washington, D. C.

There is an increasingly large number of firms distributing gasoline-alcohol mixtures in Germany as a result of the requirement that a considerable quantity of alcohol must be purchased from the monopoly. At present there is a 6 per cent alcohol mixture compulsion in force, but it is expected to be increased to 10 per cent on October 1, the report indicates.

The practice of mixing alcohol with gasoline for motor fuel purposes has increased the German consumption of alcohol materially and at the same time caused a decline in the imports of gasoline. Reports covering the consumption of alcohol for the first three quarters of the current fiscal year, October 1, 1931, to July 1, 1932, show that consumption amounted to 749,448 hectoliters, as compared with 317,204 hectoliters in the same period a year ago. (Hectoliter equals about 26.42 gallons.)

The increased use of alcohol with gasoline as a motor fuel, combined with other factors including the decrease in the use of automobiles, has caused a decline in the demand for American gasoline.

[2] Marsh and Robinson—Means of Controling Gas-Oil Ratio, Trans. A.I.M.&M.E., 1928-29, p. 183 et. seq.

[3] Hayward—Sand Conditions Set Gas-Oil Ratios, The Oil and Gas Journal, March 3, 1932, p. 16.

[4] Beecher and Parkhurst—Effect of Dissolved Gas on Viscosity and Surface Tension of Crude Oil, A.I.M.&M.E., Petroleum Development and Technology in 1926, p. 53.

[5] Dow and Calkins—Solubility and Effects of Natural Gas and Air in Crude Oil, Bureau of Mines Report of Investigation No. 2,732, February, 1926.

[6] Lacey—Rates of Solution of Gas in Oil, International Petroleum Technology, 8-9-413 (August, 1931).

Built *and* Erected Storage *and* Special Steel Fabrication

The GRAVER Organization realizes the present needs of the petroleum industry and is equipped to render service in keeping with today's requirements. GRAVER engineers are trained to the Industry and to modern economies in design and erection. Our field erection is recognized for its good workmanship. For nearly seventy-five years GRAVER has been building integrity into its tanks and steel plate construction. Rely upon Graver for today's needs. Remember GRAVER for the needs of tomorrow.

Let GRAVER Figure

GRAVER manufacturing and fabricating facilities for tanks of all descriptions and steel plate construction are unexcelled, yet production costs are low.

Ask About the Graver Plan

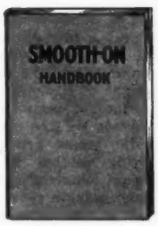
East Chicago • **GRAVER TANK & MFG. CORP** • *Indiana*

Representatives in Principal Cities

GRAVER

The dependable combination for tight joints

SMOOTH-ON CORRUGATED IRON GASKETS coated with SMOOTH-ON No. 1



Write for this free booklet.

FLANGED joints that never did stay tight can be put on their good behavior *and made to stay there* by using the above combination. Try it where the trouble comes from excessive vibration, extreme pressure, thin hot oil, superheated steam or wide temperature variation. The perfect permanent tightness will prove a surprise.

If you do not have Smooth-On Gaskets handy, at least use Smooth-On No. 1 as a filler. Increases holding strength and useful life of any reasonably good gasket material.

SMOOTH-ON Mfg. Co., Dept. 66
570 Communipaw Ave., Jersey City, N. J.
Please send copy of SMOOTH-ON HANDBOOK.
Name_____
ADDRESS_____
_____
10-6-32

Get Smooth-On Corrugated Iron Gaskets in any pipe size from ⅜ in. to 12 in., and Smooth-On No. 1 in 1 or 5-lb. can or 25 or 100-lb. keg from your supply house or direct from us.

***Do it with* SMOOTH-ON**

V-port VALVE

FOR quiet operation at all times when demands are fluctuating, for sure and exact regulation under light loads as well as heavy, a Vigilant Liquid Level Regulator with V-port Valve is recommended. Wide-open, it has a capacity equal to that of the pipe. When flow is at minimum, the distance between valve and seat is still enough to assure free action.

Vigilant

There is a C-F regulator exactly suited to every requirement of gas control. Well known for more than 40 years. Catalog on request.

The Chaplin-Fulton Mfg. Company

28-40 Penn Ave. Pittsburgh, Pa.

CF

REPRESENTATIVES:

WESTCOTT & GREIS, Inc., *Sales and Service* Dallas—Tulsa

C. H. COLLINS 628 Dwight Bldg. Kansas City, Mo.

HIMELBLAU, AGAZIM & CO., 228 N. LaSalle St. Chicago, Ill.

Or Any Jobber

Reservoir Energy: Its Source, Ownership and Utilization in the Production of Petroleum

By JOSEPH B. UMPLEBY*

The oil industry is at the parting of the ways in relating fundamental engineering concepts to legal interpretations and field practices. The old concept, based on an erroneous analogy to wild game, that oil and gas are migatory substances and belong to him who reduces them to possession regardless of their point of origin in the reservoir, has come to be quite generally recognized as the basis of many of the serious ills and extravagances of the industry. The chain of consequences resulting from this erroneous conception has been traced elsewhere and need not be recounted here. The important problem at this stage in the development of the industry, when laws are being revised by legislative action and modified by court decisions; when added powers are being exercised by voluntary committees and official regulatory bodies; and when the need for control of output has forced itself to the forefront, is to see to it that new law and action are based on sound engineering concepts.

Reservoir Energy Common Property

Since the study of gas instituted by the Marland committee of the American Petroleum Institute in 1927, a great mass of information has accumulated concerning the function of gas in the development and production of oil. This wealth of data leads to the conclusion that every oil pool contains three resources: Oil, gas and reservoir energy. I take it that the central problem of this symposium is the ownership of these three resources and that "source" and "utilization" are involved because of their bearing on ownership through the demands of equity and conservation. In order to facilitate the discussion, permit me to state categorically, that: The oil and gas in a particular tract should belong to the owners of the mineral rights in that particular tract, but the reservoir energy should be common property of all owners of mineral rights in the pool.

I take it that apportionment of oil and gas among owners according to the relative amounts that exist in place in their respective tracts, is sound from the standpoint of equity and does not require further detailed analysis. That reservoir energy should be considered in a different category, is not so obvious and requires careful study.

Reservoir energy is set apart by the nature of its origin and existence. In origin, it results from forces of compression acting on the entire contents of the reservoir. These forces may have manifestations such as hydrostatic head, superimposed beds, or diastrophism, but in last analysis gravity, operating over a much wider area than the limits of the pool, is the cause. Reservoir energy depends on the continuity of the confining beds, so that puncturing the container at any single point affects the whole. It is more a conditioning factor than a recoverable resource. Its chief value results from work performed within the reservoir rather than work done at the surface. Compressor plants can duplicate such work as reservoir energy effects at the surface, but it is impossible to duplicate its work in the sand, because oil, in the absence of agitation, absorbs gas so slowly as to be negligible.

Best Practice

The demands of efficiency and conservation also place reservoir energy in a separate and distinct category. Best practice calls for the greatest production of oils at the least possible expenditure of reservoir energy. It is generally recognized that the energy system is exhausted long before the reservoir is drained of oil. Probably, on the general average, recovery does not exceed one-quarter of the oil in the sand. The greatest and most practical conservation applicable to oil pools is a proper conservation and utilization of reservoir energy to the end that ultimate recovery may be increased.

It follows from these considerations, that reservoir energy is a status of the reservoir to be maintained for the common benefit rather than a product to be apportioned among individuals. It cannot be divided and maintain its usefulness. If reservoir energy is thus utilized, it is almost a corrolary that unit costs will be lowered, because additional recovery, a longer flowing life, and less fluctuations in production far outweigh deferred income.

If we accept reservoir energy as a status to be maintained for the common good rather than a product to be divided, on the one hand, and apportionment of oil and gas among owners according to amounts in place, on the other, it becomes necessary to consider in detail the bearing of one further engineering fact.

Control of Gas

Regardless of the nature and origin of the reservoir energy, the fact remains that in most pools it is stored in the gas—both in gas dissolved in oil and free gas. The free gas is important because of its tendency to expand. The dissolved gas is important for this reason, and for the added reason that its presence makes the oil more fluid. If the free gas is allowed to escape, the dissolved gas becomes free gas progressively as the pressure drops. Hence, in the ideal operation the gas of the reservoir should not be marketed until all the oil capable of economic recovery has been removed. If then, we consider oil and gas in the same category, what basis can we have for allowing the early production of oil and requiring the deferred production of gas? It would seem that this step must be based on principles of conservation, but equity clearly requires that the owner of gas be compensated for deferred income.

It is hoped that discussion will take the two-fold direction of analyzing first, the soundness of the proposition from a technical viewpoint, and second, the consequence of its adoption from legal and operating angles. The first is peculiarly the problem of the scientist and engineer; the second belongs more to the lawyer and the executive. It is particularly fortunate that both groups are represented at this meeting and both are urged to join in the discussion.

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

Remarks of W. P. Z. German

General Attorney for Skelly Oil Co.*

The question as to the ownership of reservoir energy in an oil pool is a very interesting one. There is an inseparable connection between the right to take the oil and gas and reduce them to possession on the surface and the right to use reservoir energy in doing so. This energy is an invisible, intangible force or power present in the formation which confines the oil and its accompanying gas; it is imprisoned by the same physical barriers which hold the oil and gas, and its efficient functioning is attained by a control of the movement of the oil, gas and the underlying or adjacent water. However, it is unlike either the oil or gas in that it cannot be reduced to possession and saved on the surface, and in that its value lies solely in its usefulness in recovering and reducing the oil, and to some extent the gas, to possession above the surface. Its tremendous value for that purpose is now well recognized, and except therefor it is not now known to have any value at all. It can take the place of expensive equipment and operations which could partially do what it alone can do on a large scale. So, this energy must be regarded as property and as belonging to the owners of the oil pool. It is the property of those who have the right by virtue of their interests in the land over the pool to take out and own the oil and gas; but in what proportions or to what extent do they own it?

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

Supreme Court Decision

The Supreme Court of the United States, on May 16, 1932, in the case of Champlin Refining Co. vs. Oklahoma Corporation Commission, definitely spoke as to the power to regulate the use of reservoir energy. After holding that the legislature of the state has the power to regulate oil and gas extraction in order to prevent unnecessary loss, destruction or waste, the court made the following statement which relates to the use of the energy, namely:

"And that power extends to the taker's unreasonable and wasteful use of natural gas pressure valuable for lifting the oil to the surface * * *."

Thus, it was in effect announced by the highest court in the land that the utilization of reservoir energy is subject to regulation under the police power of the state with a view to preventing an unreasonable and wasteful use thereof to the injury of others; that the due process clause of the Fourteenth amendment constitutes no bar to the enactment and enforcement of a regulation of that kind. But, it failed to speak as to the title thereto.

In view of this holding as to the power of regulation, I have been wondering whether we should concern ourselves with the question of title. Whether the energy is the common property of all the proprietors in the pool, or whether each proprietor owns that which is attached to and is physically positioned within the boundaries of his own land at any particular moment, may, as a practical matter, be of no particular consequence, because effective regulations dealing with oil recovery will cover the use of the energy.

Ownership in Place

Certainly, so it seems to me, in those states where the oil and gas are not owned in place but constitute a common fund, no one will be likely to contend that the energy is owned in place. As to the rule in the other states where the landowner owns the oil and gas in place beneath the surface of his land, someone might make the contention that he also owns the energy lying thereunder and may draw energy from elsewhere and thereby acquire title to it. But, if he were correct, what would be gain? In such states the courts have so far sustained conservation statutes prohibiting physical waste and protecting correlative rights, and in so doing have announced the same identical rule with reference to the power of regulation and the reason therefor which obtains in those states where the oil and gas are not owned in place. For example, the very question as to whether in Texas ownership in place deprived the legislature of Texas of the power to regulate the production of oil and gas was squarely presented and expressly passed upon in a group of recent three-judge Federal court cases. (Peoples Petroleum Co. vs. Ross S. Sterling, and others, decided in the summer of 1932.) There the court held that the power of regulation nevertheless existed. The court cited in support of its view the decisions of the Supreme Court in cases coming up from states where there is no absolute ownership in place, among them being Ohio Oil Co. vs. Indiana and Champlin Refining Co. vs. Oklahoma Corporation Commission. So, even if it should be held in such states as Texas that the energy is owned in place, still the power of regulation of its use must be the same as in states where the common fund theory obtains.

In all the states the power of regulation of production of oil and gas is predicated on the physical fact that those substances are of a migratory and fugaceous nature and that any one operator will by an excessive and disproportionate extraction from his own wells injure his neighbors when they are not able to likewise operate their wells, and that underground waste to the injury of all may occur unless there is a controlled operation of the pool as a whole. Certainly, the same reasoning applies, and with much more force, to the regulation of the utilization of the energy, and hence the power to regulate must exist and no vested property right can serve to defeat it.

Energy Is Common Property

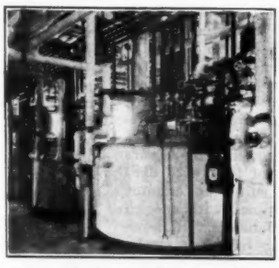
Regardless of these observations, it may nevertheless become important to ascertain the location of the title. It seems to me that whether or not the oil and gas are owned in situ, the energy can in no event be said to be anything other than the common property of all the proprietors in the pool. If there were several separate owners of specific portions of a steam-boiler in which a high steam pressure had been developed and each respective owner had the right to utilize power existing within the boiler, would any one of the owners be the possessor of the right to a particular section of the existing pressure? There could be no physical separation of it. Each would be entitled to use only a fair proportionate part of the whole; and in taking it, he ought to be required to have due regard for the like right of the other owners. An obvious difference between such a situation and the one we are considering is that there the steam pressure is of no value to bring another thing of value out of the boiler, whereas, reservoir energy is of no value save to recover the oil. It does its work within the reservoir, thence up to and through the mouths of the wells. It is not only the power it possesses but the manner in which it exerts itself within the reservoir that counts. Hence, it is hardly correct here to say that a proprietor is entitled to his fair proportionate part of the energy, for all the proprietors are justly entitled to have it perform its work in an efficient manner. This may call for a substantial departure from any effort to proportionately distribute it. So, the ultimate conclusion in every state ought to be that no landowner owns any measurable part of the reservoir energy, but they all own it jointly and severally; that each has a mere right to the beneficial use of it

(Continued on Page 56)

30

TYPES OF GREASE

Each one scientifically compounded *for a specific use . . .*



Section of a Battery of Steam-Jacketed Kettles where greases are cooked

● No one, or two, or twenty greases will economically meet all automotive and industrial needs. Greases of different characteristics are required to maintain a protective film under the different conditions of pressure, temperature, motion and moisture which are confronted.

Realizing this, Pure Oil engineers and refinery experts have scientifically compounded a different type of grease for each specific need . . . 30 types in all, and most of these in several different grades. Grease making is an important Pure Oil operation.

Pure Oil greases are made of highest grade fats, and of oils selected because of their ability to protect bearing surfaces under specific operating conditions. They are free from non-lubricating fillers of every kind. The most modern equipment for the scientific and economical production of grease, coupled with expert supervision, insures uniform quality—exactly to specifications.

Whatever type of grease is required, Pure Oil can supply it—economically. Grease plants at Marcus Hook, Pa., and Muskogee, Okla., supplemented by conveniently located warehouses, insure quick delivery to any point.

PURE

For a can or a carload, phone, wire or write nearest office for prices and specifications.

REFINERIES:
Marcus Hook, Pennsylvania
Cabin Creek Jct., West Virginia
Heath, Ohio
Ardmore, Oklahoma
Muskogee, Oklahoma
Smith's Bluff, Texas
Toledo, Ohio
Midland, Michigan

SALES OFFICES:
Chicago, Illinois
New York, New York
Minneapolis, Minnesota
Philadelphia, Pennsylvania
Pittsburgh, Pennsylvania
Columbus, Ohio
Charleston, West Virginia
Norfolk, Virginia
Atlanta, Georgia
Jacksonville, Florida
Tampa, Florida
Miami, Florida
Pensacola, Florida
Tulsa, Oklahoma
Beaumont, Texas

PRODUCERS, REFINERS, MARKETERS OF A COMPLETE LINE OF PETROLEUM PRODUCTS

THE PURE OIL COMPANY ~ U. S. A.

Limitation of Oil Production to Market Demand; Review of Legislation Shows Confusion

By ROBERT E. HARDWICKE*

The question of whether the production of oil should be limited to market demand has been constantly discussed during the last two years. Oil men, legislatures and courts have reached highly conflicting conclusions. We find the opponents of limitation to market demand asserting that it is a scheme of the big purchasing companies to fix prices and to create a monopoly. The proponents, on the other hand, declare that such a limitation is necessary to prevent physical waste and that the effect on prices is merely incidental.

A brief review of market demand legislation will disclose the confusion existing. The laws of Oklahoma,[1] prohibiting waste of oil and gas, specifically authorize limitation to market demand as a method of preventing such waste. These laws and the proration orders based thereon have been upheld by the supreme court of Oklahoma, by several three-judge Federal district courts, and by the Supreme Court of the United States.[2] Kansas has a similar law[3] but no case has been found which discusses its validity. About a year ago the California legislature passed a comprehensive conservation act, generally known as the Sharkey Bill, giving authority to restrict production to an amount representing current requirements for use, taking into consideration oil and products in storage. This may be considered as equivalent to limitation to market demand. The act was defeated upon referendum vote after a hard fought campaign in which it was charged that the act would result in destruction of the independent operators.

Weakness of Statutes

Prior to the Act of 1931, the laws of Texas prohibited waste generally but provided that the term "waste" should not include economic waste. Various definitions of waste were then stated, with no reference whatever to market demand.[4] The administrative board issued proration orders limiting the production to market demand on the theory that excess production causes, or results in, waste. Suit was filed by the Danciger Oil & Refining Co. attacking the validity of such orders. Upon judgment being rendered by the trial court upholding the orders, the case was appealed to the court of civil appeals. While it was pending on appeal, the great East Texas Field, in the summer of 1931, got completely out of control, one factor being the weakness of the statutes with respect to enforcement of proration orders pending litigation. Production approximated 1,000,000 bbls. a day, and the price went below 10 cents a barrel.

A special session of the legislature was called by Governor Sterling to meet the situation. A bill, sponsored by a large group of independent operators and several major companies, was introduced which specifically authorized limitation of production to market demand for current use and consumption. A very bitter fight resulted. While the legislature was considering the various bills, a three-judge Federal court, in a suit filed by Alfred Macmillan and others, announced its decision to the effect that proration to market demand was unauthorized as it had no reasonable relation to physical waste, but to the contrary was an effort to fix prices and therefore dealt with economic waste, which was prohibited by the existing statutes.[5]

Market Demand

The governor, in a message to the legislature, called attention to the Federal court decision and declared that he would veto any bill which authorized restriction of production to market demand, in as much as he believed that price fixing would occur. Beyond doubt, the decision by the three-judge Federal court and the attitude of the governor were strong influences in shaping the law which was passed and is now on the books.[6] It prohibits, by specific definitions, almost every conceivable kind of waste of oil and gas, but emphatically declares that the administrative board shall not consider market demand and that production should never be limited, directly or indirectly, to market demand. On March 23, 1932, being the same day the Champlin case was argued in the Supreme Court of the United States, the court of civil appeals, in the Danciger case, upheld the orders of the administrative board, based on the old law, finding that physical waste inevitably follows production in excess of market demand, and consequently the administrative board was necessarily authorized to limit production to market demand in order to prevent such waste. It was also held that the effect upon price was purely incidental to the main purpose of preventing physical waste.[7] Writ of error in this case has been granted by the supreme court of Texas with the notation, "granted because of the importance of the questions."

The decision by the court of civil appeals in the Danciger case is in direct conflict with the decision by the three-judge Federal court in the Macmillan case. The latter case is now on appeal to the Supreme Court of the United States, consequently it will not be long before these important legal questions will be authoritatively decided.

It is clear, however, that there is great confusion as to the purposes and effect of limiting production to market demand. Several splendid articles have recently appeared in law reviews, discussing generally the control of oil production, and they, too, reflect the conflict of opinion on market demand limitation.[8]

Economically Sound

From an economic standpoint the limitation of the production of any commodity to the demand therefor is in accord with sound principles. The evils following overproduction are too well known to require comment. The opponents of market demand regulation point to the disastrous results caused by efforts to control silk, cotton, rubber, coffee, etc. It should be remembered, however, that the attempted control of such commodities was entirely different from that suggested for oil. With reference to petroleum, the idea is to prevent overproduction, not to keep the oil off the market and peg its price after it has been produced. Furthermore, the peculiar characteristics of oil and gas, the reactions taking place upon production, the effect which production from one tract has upon another, create complications which do not exist with reference to other commodities and which make analogies virtually pointless.

It is now well settled that the State may regulate the production of oil and gas to prevent waste. The decisions justify the conclusion, or at least the argument, that the right also exists to regulate production, irrespective of waste, in order to protect and adjust the correlative rights of the various owners of an oil and gas pool.[9] Based upon the assertion that it was impossible to determine the source of oil and gas which were produced from a well, the courts in the early cases declared that the lessee, subject to the terms of the lease, acquired title to all the oil and gas which came from a well on the leased land.[10] This rule has been consistently followed.

Correlative Rights

As a corrolary, it was likewise held that, to prevent the drainage, the owner or lessee of a tract of land must drill offset wells and thus protect his oil reserves as best he can.[11] In view of present scientific knowledge, it is possible within reasonable limitations to determine at least the relative amounts of oil and gas in place and to trace fairly accurately the underground migration. Indeed, the fact and the amount of migration across property lines have often been recognized by the courts in damage suits by lessors based upon the failure of lessees to drill offset wells. In these suits the amount of migration was determined with enough accuracy to support judgments.[12] If, however, the mere drilling of offset wells does not offer complete protection of property rights it seems logical to say that the legislature may otherwise regulate the production of oil to give better protection to the owners thereof. In other words, one of the purposes of government is to adjust correlative rights, and scientific knowledge has advanced far enough to justify control of the production of oil and gas for the sole purpose of protecting the interests of the various owners to the end that each will get his fair share. Obviously the waste of oil and gas by any operator reduces the amount available to the other owners of the pool and, therefore, the prevention of waste is a proper factor in the adjustment of correlative rights.

Loss in Storage

It is obvious that in periods of overproduction the oil which is not needed for current use and consumption must go into storage. A certain amount of storage is necessary for working stocks and reasonable reserves, therefore the evaporation and loss which take place from this character of storage are unavoidable. It follows, nevertheless, that all storage in excess of this amount is really unnecessary, consequently the evaporation and leakage, which are considerable even with the best of equipment, are avoidable. Being avoidable, the loss becomes waste. In most instances a serious fire hazard also exists.

Does it not follow that physical waste inevitably occurs above ground whenever there is production in excess of the market demand? At this point it should be stated that the words "market demand" are very broad. A market demand for oil for speculative storage may exist as well as a demand for current use in a refinery. The Sharkey Bill in California and one of the bills which was introduced in the Texas legislature undertook in effect to limit production to market demand for current use and consumption, which would have cut off market demand for speculative purposes. If it be assumed that a State can prohibit unnecessary storage, such an act would affect only storage within the State; consequently, a mere prohibition against storage would not reach the desired ends. There is some doubt whether, under a market demand provision, an administrative board could ignore the demand for oil to be shipped out of the State even for the admitted purpose of being placed in open storage and for speculation. However, a discussion of that question would be out of place in this paper.

Waste Underground

In addition to waste above ground caused by overproduction, there is waste underground which is more serious. There is no need to discuss in detail the various factors which enter into underground waste. It will be assumed that, as a rule and regarding physical waste only, oil and gas should be produced in such manner and amounts as will prevent dissipation of the reservoir energy, the premature and irregular encroachment of water and the premature abandonment of wells. It will be conceded that ratable production and maintennace of reservoir pressure are highly desirable in order to secure maximum ultimate recovery. Let us now see whether overproduction causes, or results in, underground waste.

We shall start with a pool which is producing 100,000 bbls. a day under absolutely ideal conditions. There is no dissipation of gas energy, no premature or irregular water encroachment, gas-oil ratios are sufficient, and there is a uniform drop in reservoir pressure. Furthermore, every barrel of oil which is being produced is at once marketed and refined for current needs. There is no waste whatever. If, over night, the demand for the oil from that pool should be increased to a total of 150,000 bbls., it does not follow that the pool should be permitted to produce that amount. If the increased production should be allowed, it is reasonably certain that serious underground waste would take place, and, from a conservation standpoint alone, the production of the pool should be restricted to 100,000 bbls. The market demand limitation applies only when overproduction exists and, therefore, would have no bearing on the conditions just outlined.

What would happen should the market demand for the oil from the field be reduced from 100,000 bbls. to 50,000 bbls. caused by the withdrawal of one of the purchasing companies? Clearly, if the operators should continue to produce 100,000 bbls. when there was a demand for

---

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

[1]Sections 7,954, 7,956, 7,957, C.O.S. of 1921.

[2]Julian v. Capshaw, 292 Pac. 841; Champlin Refining Co. v. Corp. Comm., 51 Fed. (2d) 823; Champlin Refining Co. v. Corp. Comm., 52 Sup. Ct. 559.

[3]Kan. Laws, 1931, c. 226, p. 332.

[4]Acts 1929, p. 694, Chap. 313, Sec. 2.

[5]Macmillan et al v. Railroad Comm., 51 Fed. (2d) 400.

[6]Acts 1931, 1st Called Session, Chap. 26.

[7]Danciger Oil & Refining Co. v. Railroad Comm., 49 S.W. (2d) 837.

[8]Merritt, "Stabilization of the Oil Industry and Due Process of Law," 3 So. Cal. Law Rev. 396 (1930); 31 Columbia Law Rev. 1176 (1931); Marshall and Meyers, "Legal Planning of Petroleum Production," 41 Yale Law J. 33 (1931); Ford, "Controlling the Production of Oil," 30 Michigan Law Rev. 1170 (1932).

[9]Ohio Oil Co. v. Indiana, 177 U. S. 190, 20 Sup. Ct. 576, 44 L. Ed. 729; Lindsley v. Natural Carbonic Co., 220 U. S. 61, 31 Sup. Ct. 337, 55 L. Ed. 369; Walls v. Midland Carbon Co., 254 U. S. 300, 41 Sup. Ct. 118, 65 L. Ed. 276; Randini Pet. Co. v. Superior Court, 52 Sup. Ct. 105; Champlin Ref. Co. v. Corp. Comm., 52 Sup. Ct. 559; Julian v. Capshaw, 292 Pac. (Okla.) 841; People v. Associated Oil Co., 294 Pac. (Calif.) 717.

[10]Westmoreland Nat. Gas Co. v. DeWitt, 18 Atl. (Pa.) 724; Brown v. Spilman, 155 U. S. 665, 15 Sup. Ct. 245, 39 L. Ed. 304; Barnard v. Monongahela Gas Co., 65 Atl. (Pa.) 801; Kelly v. Ohio Oil Co., 49 N. E. (Ohio) 399, 39 L.R.A. 765.

[11]Barnard v. Monongahela Gas Co., 65 Atl. (Pa.) 801; Kelly v. Ohio Oil Co., 40 N. E. (Ohio) 399, 39 L.R.A. 765; Prairie Oil & Gas Co. v. State, 231 S. W. (Tex.) 1088; Peterson v. Grayce Oil Co., 37 S. W. (2d) 567 (Tex.); Cain v. South Penn. Co., 86 S. E. (W. Va.) 883, L.R.A. 1916 B 1002.

[12]See discussion of cases by Merritt, "Covenants Implied in Oil and Gas Leases," Sec. 95 et seq. See also discussion in Blair v. Clear Creek Co., 230 S. W. (Ark.) 286; I. Thornton, "Oil & Gas," (5th Ed.) Sec. 197 (Sec. 122 b, 4th Ed.).

only 50,000 bbls., the excess oil would go into storage. The unnecessary storage, with attending evaporation, leakage, and fire hazard, could be prevented by limiting the production to 50,000 bbls. If ratably produced, reservoir pressure would be maintained, water encroachment would be controlled, though perhaps there would be disturbances of efficient gas-oil ratios for some wells. It would be unlikely that the operators would have sufficient storage to take care of the 50,000 bbls. a day excess, unless open storage were used. What conditions would then exist?

Dissipation of Gas Energy

With the allowable for the field at 100,000 bbls. a day and a market for only 50,000 bbls., some of the operators would continue to produce their full allowable, having storage or market. Others would produce only a portion of their allowable, having limited storage or market; while still others could not produce at all, having no storage or market. Drainage across property lines and inequities would necessarily occur, which could only be avoided by full production by all operators to the allowable and the use of extremely wasteful open storage. The alternative to wasteful storage would be production in highly varying percentages of the allowable.

This lack of ratable production would cause dissipation of gas energy, would increase abnormally the drainage area of some wells, would result in concentrated withdrawals, would upset the uniform reservoir pressure and the regular encroachment of water, thereby causing not only serious underground waste but inequities as between property owners. The facts just outlined are substantially similar to those which were under consideration in the Champlin case which was decided by the Supreme Court of the United States. It was held that ratable production, limited to market demand, prevented waste and adjusted the correlative rights of the various owners.

The proponents of the market demand control say that, in order to prevent the waste and inequities just outlined, it is necessary to restrict the production from the field to 50,000 bbls., being the market demand for the oil from such pool. Upon such restriction, the various operators would be in relatively the same position as when producing under the ideal conditions existing with the market demand at 100,000 bbls. There would be no overproduction and consequently no unnecessary storage, each operator would have his share of the market and would produce ratably with his neighbors. We have dealt only with physical conditions and, while it may be true that market demand is not a physical condition, a change in the market demand reacts upon the operations in a pool and it, therefore, has a direct bearing upon physical conditions and waste.

Interstate Compact

The Oil States Advisory Committee has recommended an interstate compact by virtue of which the consumptive requirements will be apportioned among the oil producing states and the production will be limited accordingly in each state. A bill providing for such compact or compacts was introduced in Congress at its last session. It seems to be contemplated that, after the allowable for a state has been determined, the state will then, by proper procedure, apportion the amount among the various fields. In theory the plan is splendid, for, by proper apportionment, marginal fields could be saved and discrimination by purchasers avoided. On the other hand, from a practical standpoint, the difficulties are numerous. The problem would be simplified if all oil were of the same grade and if the pipe lines served all of the fields. Such, of course, are not the facts. Heretofore market demand for each field has been separately determined.

After the allowable for a pool has been ascertained, based on market demand or other factors, the problem of distribution of the allowable then arises. The laws of Oklahoma provide for distribution on the basis of potentials. The Texas statutes leave the matter of distribution to the administrative board. Obviously, different conditions exist in different pools so that a method which is proper in one may be inequitable in another; nevertheless, it must be admitted that real difficulties arise in working out scientific and equitable distribution.

Distribution Problem

Almost every conceivable plan has been tried in Texas. For instance, distribution in the Panhandle Field is based on potentials; in Yates, on a combination of potentials and acreage, with periodic adjustments based on reservoir pressure declines; in East Texas, on the flat well basis; in Van, on the recoverable reserve estimate or acre foot basis; in Conroe, upon flat allowance per well plus additional allowance for acreage. It is not the purpose of this paper to discuss the best methods. It is clear, nevertheless, that, having once found the proper allowable for the pool, such limitation prevents the evils and waste which occur only when there is a scientific distribution of the allowable. Equity between operators should also be the goal. Surley it is permissible to add that, in the face of such difficulties, a court should hesitate to substitute its own judgment for that of the administrative board, and proration orders should be upheld unless clearly unreasonable.

It is often asserted that a monopoly will be fostered by limiting production to market demand. The reasoning is so tortuous that it has never been understood and cannot, therefore, be faithfully repeated. It seems to be claimed, however, that, since the major companies are the largest purchasers, the limitation to market demand will enable them to control the market. If the major companies are virtually the only purchasers, it inevitably follows that they have control of the market to that extent. Limitation of production to market demand does not change the situation. It simply deals with the facts as they exist. In determining market demand, the demand or requirements of all purchasers and users, big and little, are considered, or at least should be.

Determining Demand

It has also been asserted that market demand is an indefinite thing, fluctuating from day to day, and changing radically with desires of purchasers and variations in price, thus making it utterly impossible to determine the demand for any fixed period. From a theoretical and academic standpoint these assertions are probably correct, at least as to most commodities. With respect to oil, however, there is usually one price at any given time for the oil from the pool, the purchasers are known, and the demand or requirements can be ascertained with more than reasonable accuracy. Furthermore, any error in determination of the demand for a pool may easily be detected and corrected, for, if it be too high, there will be production without a market or outlet, and, if too low, purchasers will be wanting more oil and asking for an increase of the allowable.

Effect on Prices

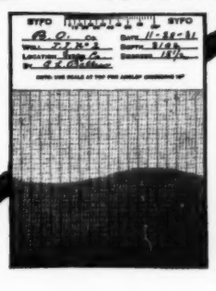
The opponents of limitation of production to market demand place great stress upon the argument that price fixing results. It must be admitted that, if the limitation of production to market demand reduces materially the amount of production, such act will likely have an effect upon the price of oil. There is tremendous difference, however, between an act which affects prices and one which fixes prices. The point may be illustrated by what took place in California. Under the law of California,[12] the unreasonable waste of gas was prohibited. When the gas waste was reduced by requiring more efficient gas-oil ratios, the production of oil was reduced at the same time. It was claimed that, since the prevention of the waste of gas resulted in limiting oil production which affected prices, the act and the administrative orders thereunder were void as being price fixing measures. The supreme court of California held that the State unquestionably had the right to

[12]Cal. Stat. 1929. c. 535, p. 927.

WHAT USERS SAY-No. 9

"The information obtained through these SYFO surveys is of great value to us, and we are indeed satisfied with your service on same"

SYFO Clinograph



SAFE
SPEEDY
ACCURATE
INEXPENSIVE

SPERRY-SUN WELL SURVEYING COMPANY
1608 WALNUT STREET, PHILADELPHIA, PA.

DALLAS, TEXAS
1501 Caruth Street

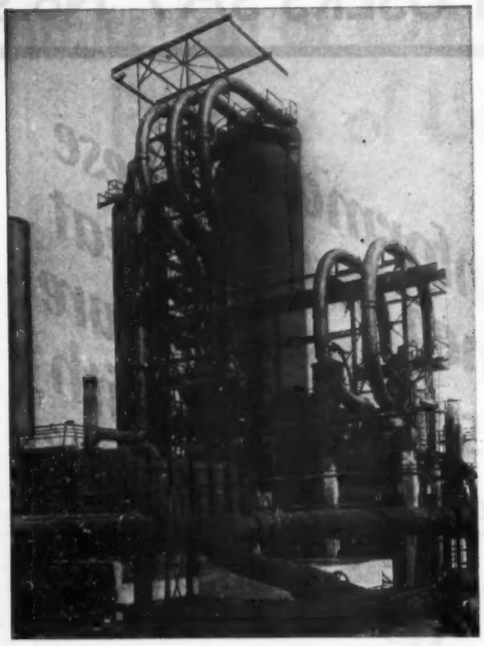
TYLER, TEXAS
Peoples Nat'l Bank Bldg.

LOS ANGELES, CALIF.
415 Petroleum Securities Bldg.

TULSA, OKLA.
402 Petroleum Building

HOUSTON, TEXAS
820 Esperson Bldg.

WICHITA FALLS, TEXAS
339 Harvey Snider Bldg.



the largest Atmospheric-Vacuum Still ever built.

GULF

MODERN METHODS

MAKE MODERN

GULF PRODUCTS

Paraffine and Coastal Crudes

Gasoline — Lubricating Oils

Naphtha — Gas — Oils

Wax — Petroleum Coke

Cylinder — Engine — Cordage

GULF REFINING COMPANY

General Sales Offices: Pittsburgh, Pa.

prevent waste of gas and this right could be exercised even though the price of oil was incidentally affected.[14] The Supreme Court of the United States, the supreme court of Oklahoma and the court of civil appeals for the third district of Texas have held that limitation of production of oil to market demand does not constitute price fixing.[15]

Years ago the Supreme Court of the United States[16] upheld a statute of Indiana which prohibited the escape into the air of gas, although to prevent such waste, the oil company proved that it would have to shut down its oil wells. If one of the large oil producing states should pass a similar law, it is reasonably certain that a very large number of oil wells would have to be shut in, as they were in Indiana. It is within the bounds of reason to say that the production of oil would be reduced to one-third of the present amount.

It is perfectly obvious that, by enforcing such a conservation measure, the restriction upon production would have an immediate effect upon prices, making them much higher. According to the reasoning of those who claim that limitation of production to market demand is price fixing, it would follow that the State could not prevent the waste of gas because this would reduce the production of oil which would probably increase prices. If it be true that production in excess of market demand causes, or results in, waste, and that limitation to market demand is a proper method of preventing such waste, then physical waste is the basis for the limitation and is clearly within the power of a State, although an incidental effect may be traced on prices. The limitation is predicated on physical waste, not economic waste, though some of the writers in the law reviews[17] are confused on this point.

Economic and Physical Waste

Clearly all physical waste involves economic loss or waste, but, on the other hand, economic waste does not necessarily involve physical waste. For instance, the use of high grade oil for settling dust is not physical waste but it is economic waste. Whether or not economic waste should be the subject matter of legislation is a question of policy rather than of law. The Supreme Court of the United States upheld a law of Wyoming prohibiting the use of gas for carbon black. It is observed, however, that the supreme court of Montana declared to be unconstitutional a similar act of the Montana legislature.[18] Indeed it has been forcibly argued that the State may, if it desires, fix prices or control production to such an extent that the higher prices will not justify the consumption of a natural resource for the less beneficial uses of the product.[19]

It has been asserted that the proponents of curtailed production are interested in stabilizing the industry rather than in preventing physical waste; therefore, the real motive is price fixing or price affecting, which renders void the orders limiting production. The reasoning is fallacious. Practically all states have gasoline taxes. By evading such taxes a refiner or retailer has, let us say, an advantage of 4 cents a gallon over a competitor who pays the tax. The one who evades is thereby enabled to cut prices and still make a profit. Competition requires that the taxpayer reduce his prices or lose business. From selfish and financial motives the taxpayer insists that the tax law be rigidly enforced. Surely a court would not be justified in declaring the law unconstitutional on the ground that economic motives were involved or because the enforcement officers gladly stopped the tax evasion knowing that the price of gasoline would likely be increased by such act.

If it be true that production of oil in excess of the market demand brings about physical waste and that the restriction of the output to such demand prevents or minimizes such waste, the State may, by proper legislation, enforce such a limitation. If it be assumed that the distribution of the allowable is fair and equitable, then the control of the production could also be justified as an act adjusting the correlative rights of the various owners of the pool. Many good lawyers believe that proration, ratable production, ratable purchasing and other regulations of the amount and manner of production can best be justified and sustained on the correlative rights theory rather than on the waste or pupblic rights theory. After all, the two are virtually inseparable.

[14]People v. Associated Oil Co., 294 Pac. (Calif.) 717.

[15]See cases Note 2, and Danciger Oil & Ref. Co. v. Railroad Comm., 49 S. W. (2d) 837.

[16]Ohio Oil Co. v. Indiana, 177 U. S. 100; 20 Sup. Ct. 576; 44 L. Ed. 729.

[17]See Note 8.

[18]Walls v. Midland Carbon Co., 254 U. S. 300, 41 Sup. Ct. 118, 65 L. Ed. 276; Gas Products Co. v. Rankin, 207 Pac. (Mont.) 993, 24 A.L.R. 294; See also discussion. Ford. "Controlling Oil Production," 30 Mich. Law Rev. 1170, 1182 (1932).

[19]Ford, "Controlling Oil Production," 30 Mich. Law. Rev. 1170, 1199.

Remarks of W. P. Z. German

(Continued from Page 52)

as long as it lasts and that such use is subject to such reasonable regulation as will gain the greatest obtainable good for all.

Remarks of F. O. Prior

President, Stanolind Oil & Gas Co.*

A gradual definite trend toward the recognition of the importance of reservoir energy in the production of oil has been evident in the last few years. Doctor Umpleby's paper, "Changing Concepts in the Petroleum Industry," ably chronicles this transition. There can be no disagreement by students of this new conception with the thought advanced in this paper.

The paramount problem of the allocation of the ownership and the utilization of this energy cannot, in the light of present knowledge, be adequately solved. Continued study of this energy in its two major phases, water and gas, is necessary. Field and laboratory work, exploring further the laws of solution, their variation under formational pressures and temperatures; the effect of porosity, grain size and shape on the flow of oil through sands, quantitative effect of surface tension on oil retention in sand of various characteristics, the effect of pressure, temperature, agitation and rate of flow on gas in solution and its consequent effect on viscosity and fluid flow, all must be done in detail before more than a rough approximation of recoverable reserves under the new conception can be made. Likewise, more accurate and more concise valuation methods, based upon core analyses, laboratory examination of reservoir samples, and most important, actual experience from the fields now being so operated, must be had before equitable allocation of participation rights may be made on reservoir energy ownership. No fixed set of rules, or specific laws are capable of universal application to oil-producing fields. Each field is a separate study in the allocation of energy rights and the most efficient utilization of such energy. Laws may be made, however, setting up the working body and the method of procedure for valuation and determining these factors.

Certain definite advances have been made in evolving laws, and regulation or prohibiting physical waste. It is becoming generally accepted that the new method, the new conception of oil field development, utilizing reservoir energy to the maximum is necessary for the prevention of physical waste. It follows then, that, given such laws and the police power for their enforcement, it will be compulsory upon the owners of a field to co-operatively and collectively, reach an agreement covering the ownership and use of reservoir energy. It seems, then, that until technicians have, through scientific means, determined more accurate methods of valuation, and the most efficient manner of utilization, recourse must be had to the laws governing physical waste.

*Before Petroleum Division A.I.M.E., fall meeting, Ponca City, Okla. Sept. 30-Oct. 1, 1932.

Selection of Ferrous Metals Used in Refineries Has Developed to Paramount Importance

By E. C. WRIGHT
National Tube Co.*

The refining industry has always been faced with severe operating difficulties and the proper maintenance of good safety standards, economy in operation and high capacity have not been easily achieved. The rapid changes in quality of product have also required a maximum flexibility of equipment and many refinery engineers have stated that much of their equipment becomes obsolete after three or four years of service. The transition from shell stills to pipe stills and then to cracking operations has greatly altered the design of apparatus and has made the selection of suitable materials of paramount importance. At the present time there is an increasing interest in the reforming of fixed gases and light fractions into products of high antiknock properties which will probably lead to units where operating conditions are even more severe.

Corrosion is inevitably encountered in nearly all types of refinery apparatus but the severity of corrosive loss varies widely, depending on the location of the plant and the kind of crudes being processed. Corrosion is also greatly accelerated by the high temperatures generally employed, and those parts of equipment exposed to the hottest vapors are attacked by even slight amounts of corrosive agents which are not active in the cooler parts of the stills. Even a high grade crude may introduce severe difficulties in the hotter furnace tubes, hot oil transfer lines, and the hotter part of the bubble towers.

Causes of Corrosion

Persistent study of corrosion problems by refinery engineers has established the fact that corrosion is due largely to the following causes:

1. Sulphur compounds in the crude oil which attack metals at higher temperatures.
2. Salt waters entrained in the crudes which yield dissociated salts in the stills.
3. Sulphuric acid, sulphur dioxide, sulphonated hydrocarbons which are produced in purification operations.
4. Highly aerated and often brackish waters used for cooling and condensing in the plant.
5. Furnace gases which are active causes of oxidation.

The corroding agents listed above may act in one or more of the following ways: As gases and vapors, as corroding liquids not containing water, and as chemicals dissolved in water. In most cases the chemical activity of the corrosive agents is increased by the high pressure or high temperature encountered. The selection of metals to withstand these conditions is difficult since in most applications more than one influence will need to be considered. Thus a condenser material might resist the corrosive tendency of the water used in cooling and might be attacked on the other side by the liquid being condensed, or the reverse.

Another vital consideration in the choice of refinery materials is their relative resistance to long exposures to high temperatures in service. It is necessary for safety to maintain the thickness of metal sections in the apparatus above a certain safe minimum; and the strength of the metal at the operating temperatures must be known to determine what least thickness of metal may be tolerated before replacement becomes necessary. This requires careful calipering of equipment at regular intervals to determine the decreases in metal thickness. In many places where gauging is impossible the practice of drilling holes in piping, plates, reaction vessels, etc., is common. Lately the procedure known as sentry drilling has become highly useful. This consists in drilling a small hole, usually half way through the metal section. When corrosion reaches the bottom of a hole a slight leak or seepage becomes evident which permits removal of the damaged section before rupture can occur.

*Before metallurgical meeting, Mid-Continent division, A.S.M.E., Tulsa, October 4-5.

TABLE 1—PHYSICAL PROPERTIES 4-6% CHROMIUM STEELS, SHOWING EFFECT OF CARBON CONTENT AND HEAT TREATMENT

Carbon	Chromium	Air cool	Draw	Yield point	Tensile strength	%—2 in. elong.	R.A.	Brinell	Izod
.10	5.20	875°C. 1,600°F.	None	108,860	181,420	15.5	53 2	361	23.0
.20	5.20	860°C. 1,575°F.	None	114,000	212,310	9.0	18.5	417	23.0
.30	5.30	860°C. 1,575°F.	None	118,200	222,100	13.5	31.7	448	16.9
.10	5.20	875°C. 1,600°F.	600°C. 1,110°F.	102,180	114,100	20.0	71.0	250	76.4
.20	5.20	860°C. 1,575°F.	600°C. 1,110°F.	120,100	137,600	18.5	58.7	272	36.0
.30	5.30	860°C. 1,575°F.	600°C. 1,110°F.	116,840	137,400	18 0	60.5	275	59.1
.10	5.20	875°C. 1,600°F.	Furnace Cooled	27,300	62,030	37 5	75.6	136	84.2
.20	5.20	860°C. 1,575°F.	Furnace Cooled	33,200	75,600	32 0	75.0	152	84 1
.30	5 20	860°C. 1,575°F.	Furnace Cooled	34,600	79,200	31.5	73.6	161	79.3

Tensile tests made on .505 in. standard bars.

Design of Sections

It will be evident that for apparatus operating at high pressures under severe corrosive conditions, the design of sections must be based on the minimum thickness of metal that can be safely and economically maintained. Experience with sentry drilling has shown a factor of safety at least greater than two to one, and this must be considered if the minimum metal thickness is half the original thickness of the section. Lacking accurate information as to the properties of metal at temperatures above 700° F., it is believed that refinery engineers have generally designed their sections according to steam boiler practice. Often this has been based on the room temperature strength of the materials, with an application of a factor of safety of 8 or 10 to 1, or the stresses may be based on short-time high temperature tensile strengths of the metals at operating temperatures, with a factor of safety of about 5 to 1 on the tensile strength at these temperatures. The general success of this practice has been clearly demonstrated through the past 10 years in the many complicated refinery units which have been successfully designed and operated under the most severe conditions.

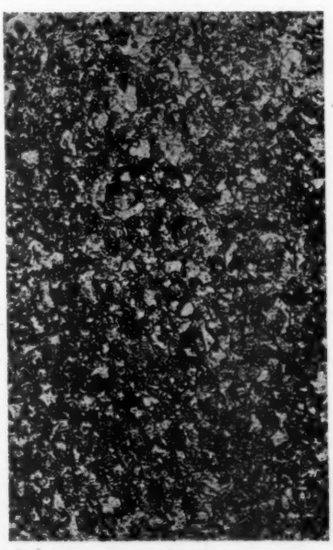
In furnace structures, design problems have arisen on account of the difficulty of maintaining definite temperatures on metal sections. Many earlier units, both of the pipe still and cracking type, suffered numerous failures in furnace tubes on account of lack of control of furnace temperatures and tube metal temperatures. Earlier furnace designs did not yield uniform heating of tubes, and moreover, variation in coke deposits was a source of continual trouble. Furnaces designed in the past few years have overcome many of these difficulties, and periodical inspection and cleaning of the tubes has greatly reduced the number of tube failures from overheating.

Usefulness and Limitations

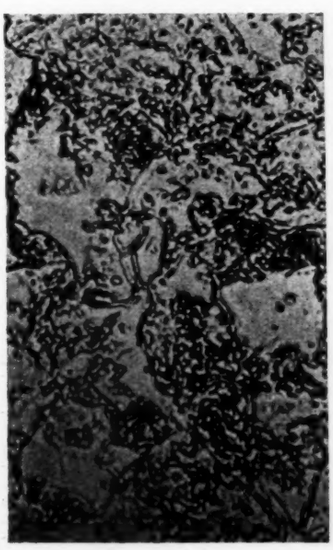
The main purpose of this paper is to discuss the kinds of metals which have been used in refinery service and to indicate if possible their relative usefulness and limitations. Original units were built entirely of low carbon boiler flue steel, and this grade is still largely used in many refineries on account of its cheapness, ease of fabrication and dependability. Long experience with low carbon boiler steel has made the engineer completely familiar with its properties, and indications are that large quantities of this kind of steel will continue to be used.

The discovery of high sulphur crudes and the increased temperatures and pressures required in cracking certain types of crude have introduced factors, however, which, in many cases, make the use of regular low carbon steel highly questionable. Many crudes containing over three-fourths per cent sulphur, attack regular carbon steel at operating temperatures so severely that in many plants the use of this steel has resulted in frequent ruptures and repairs. The so-called "sweet" crudes of the Mid-Continent and eastern districts are still being processed in regular steel without undue losses from corrosion. However, even with noncorrosive crudes it has been fairly well established that the use of regular low carbon steel under high pressures at temperatures above 950 or 1,000° F. is not a safe practice, and where these operating conditions are employed simultaneously with a highly corrosive crude, the life of the regular steel has decreased so rapidly as to make the substitution of some superior alloy almost necessary.

Typical structure of full annealed 4-6% chromium alloy
Carbon —0.13% *Chromium —5.21%*



Etched 4% HNO_3 1,000×



Etched 4% HNO_3 100×

Alloy Materials

There have been developed during the last 10 years a large group of alloy steel materials which usually show superior corrosion resistance to oxidation and greater strength at elevated temperatures. Experimental installations of most of these alloys have been made at various refineries, and as a result the application of these different alloys to specific refinery conditions has been partly determined. At the present time the 4-6 per cent chromium alloys with or without additions of molybdenum or tungsten are being used in large quantities and the high chromium nickel alloy designated as 18-8 is also finding increasing use. Aside from these, the 12 to 14 per cent chromium steel, the 16 to 20 chromium chromium steel, the 25 to 30 per cent chromium steel, and several of the higher heat-resisting alloys (such as 25 per cent chromium, 12 per cent nickel, 25 per cent chromium, 20 per cent nickel, 30 per cent chromium 15 per cent nickel, and 65 per cent nickel 20 per cent chromium, and other high alloy materials) have been used in many instances with good success. During this period, manufacturers have gained experience in the production of shapes from these special alloys, and refinery personnel have learned a great deal regarding their particular fabricating properties and other peculiarities. It will be evident that the selection of suitable material from such a wide variety of compositions will always require a rather thorough knowledge of each of the alloys under consideration.

The 4-6 per cent chromium materials have found increasing use in the form of furnace tubing, hot oil transfer lines, heat exchangers, bubble tower caps, return bends, valves, and in the form of plates, during the past six years. It has been particularly beneficial in plants processing high sulphur crudes, since the resistance of this metal to sulphide corrosion has been shown by laboratory tests to be from four to ten times that of ordinary steel, and the life of installations built from this alloy has verified this finding. The 4-6 per cent chromium alloys represent a distinct class of steels which differ somewhat in properties from the regular plain carbon or structural alloy steels and markedly from the higher chrome and higher chrome nickel alloy

steels. The structure of the 4-6 per cent chromium alloys in the fully annealed state consists of a ferrite matrix with carbide particles which are usually completely spheroidized, the simple pearlitic structures obtained in ordinary steels being produced only after very slow cooling from the critical range. Examples of fully annealed 4-6 per cent chromium structures are exhibited in Figure 1 at high and low magnification where the globular structure of the carbides is quite evident. Sufficient chromium is contained in this alloy to produce the common effect of chromium in lowering the upper critical point and raising the lower critical point, and the only important change in structure is that which occurs in the neighborhood of 850° C. (1,560° F.). Reheating of this alloy to temperatures slightly below the critical point results in softening, whereas reheating to temperatures above 850° C. (1,560° F.) followed by air-cooling, results in marked hardening.

Air-Hardening

The most noticeable property of the 4-6 per cent chrome steels is their intense air-hardening which is proportional to both the carbon and chromium contents, although alloys containing 4-6 per cent chromium and less than .10 per cent carbon will also exhibit remarkable air-hardening. This factor must be considered in all operations involving the use of these materials where reheating occurs, such as welding, Van Stoning, hot bending, forging, etc. After such operations, the metal should be annealed by heating to a temperature of 1,575° F. and cooled black in the furnace or reheated to a temperature of 1,400° F. for several hours depending upon the thickness of the section. In welding, the metal should be annealed as soon as possible after the welding operation, not only in the welded metal but also in the zone on either side of the weld. The fully annealed material, however, can be bent, flaged and expanded cold almost as readily as low carbon steel.

The air-hardening effects described above are best exhibited in the physical properties. Table 1 shows the physical properties of 4-6 per cent chromium alloys with .10, .20 and .30 carbon, respectively, in the air-hardened condition, in the air-hardened and tempered condition, and in the fully soft annealed condition. These figures indicate the very high yield points and tensile strengths that may be developed by the simple air-hardening, air-hardening and drawing, which treatments are quite as effective as the quenching of ordinary steels in liquid media. Combined with high strength, the alloys also exhibit very great ductility and impact toughness which is probably associated with the fact that the structure consists of a ferrite matrix and highly dispersed rounded carbides. The impact properties and elongation of these alloys are, in many cases, superior to those of some of the best structural alloy steels, when heat treated to the same yield point and tensile strength. Another peculiar physical property which these alloys exhibit is that in the air-hardened condition and in the fully annealed condition, the elastic ratio is low, often being less than 50 per cent; whereas, the air-hardened and tempered material shows very high elastic ratios, usually over 80 per cent.

Referring to Table 1, it will be noted that the .20 per cent carbon 4-6 per cent chromium material has a yield point of 114,000 pounds, a tensile strength of 212,310 pounds in the air-hardened condition, and a yield point of 33,200 pounds and tensile strength of 75,600 pounds in the fully annealed condition. On the other hand, this same alloy, after air-hardening and drawing at 600° C. (1,110° F.) gives a yield point of 120,100 pounds, and a tensile strength of 137,600 pounds. It will be noted also that the carbon content has an appreciable effect on the yield point and tensile strength, especially on the soft annealed material. In applications where this alloy is to be used for high temperature service, such as cracking still tubes and condensor tubes and where flanging, rolling and other manipulations are required, only soft annealed material should be employed. Exposure of semi-annealed material for long times at temperatures between 800 and 1,200° F. gradually produces a soft-annealing treatment effect.

Tests of Alloys

The discussion given above refers to tests made on a series of 4-6 per cent chromium alloys without other alloy additions. The same response to heat treatment and annealing will also be obtained with 4-6 per cent chromium steels containing either molybdenum or tungsten. Our records show that the alloy containing molybdenum has properties which at room temperatures and after different heat treatments are almost analogous to the plain 4-6 per cent chromium steels, while the room temperature properties of the 4-6 per cent chromium steels with 1 per cent tungsten are somewhat stronger. The following table shows tests on the three alloys after annealing:

	All specimens .14% carbon— Yield point	Tensile strength	Elong. % in 2"
4-6 Cr.	29,200	61,050	38.8
4-6 Cr. ..... ½ Mo.	31,250	62,100	37.6
4-6 Cr. ..... 1% W.	34,130	70,200	35.2

The addition of molybdenum and tungsten does increase the strength of these steels at elevated temperatures to a considerable degree and, according to some tests, increases the resistance to certain types of corrosion.

The higher chromium alloys of the stainless group, such as the 12-14 per cent chromium, the 15-20 per cent chromium and the 25-30 per cent chromium grades, have not been used in large quantities in the refining industry, and are not suitable materials for still tubes, but all have been tested and used successfully in one or more applications. These three alloys are almost as expensive as the 18-8 chrome-nickel grades and, in general, are much more difficult to fabricate and somewhat less resistant to corrosion. The 12-14 per cent chromium alloy is now used for shafts, valve seats, pump plungers and similar purposes, since it can be hardened to increase its resistance to abrasion. This alloy should always be quenched and afterwards polished to improve its corrosion resistance.

Neither the 16-20 per cent chromium nor the 25-30 per cent chromium can be used at elevated temperatures under conditions of high stress, if the structure is to be repeatedly heated and cooled. When either of these alloys is cooled slowly from temperatures between 800° F. and 1,100° F., it exhibits brittleness at room temperature although this brittleness is not present at operating temperature. This condition prohibits the use of these alloys for furnace tubes and other parts subjected to high pressures. The 25-30 per cent chromium alloy is, however, applicable to vapor phase operations where pressures do not exceed 50 pounds, and at least two successful installations of 25-30 per cent chromium tubes have been operating for over two years in vapor phase units running at low pressures with temperatures as high as 1,600° F. The 25-30 per cent chromium alloys are superior to the 16-20 per cent chromium alloys in resistance to corrosion and oxidation at high temperatures. Both of these alloys may be annealed by heating to 1,400-1,450° F. and neither can be noticeably hardened by quenching as can the 12-14 per cent chromium steels.

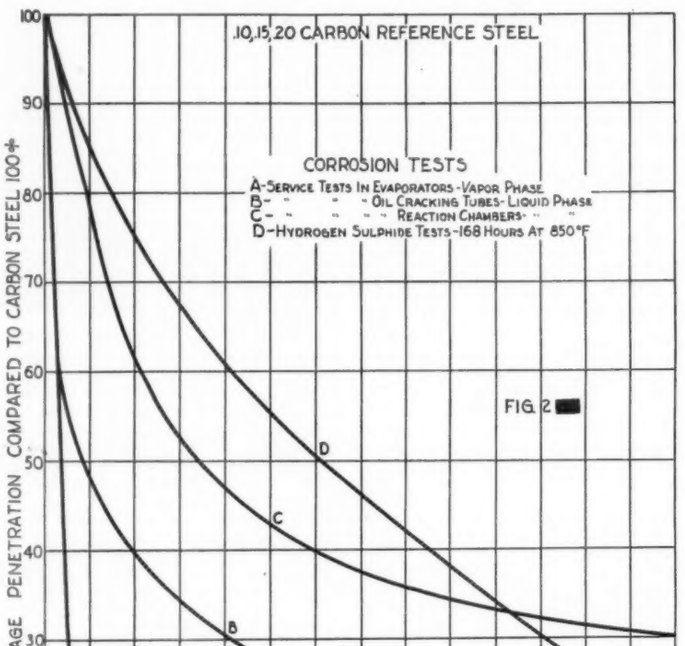


FIG. 2

Different Basic Structure

The most important of the chromium-nickel alloys are those of the 18 per cent chromium-8 per cent nickel type. This series consists of a considerable number of alloys containing from 16-20 per cent chromium and 7 to 10 per cent nickel, to which may be added varying amounts of carbon, tungsten, copper, molybdenum, titanium, and, possibly, other elements. The basic srtucture of these alloys is entirely different from that of the steels previously discussed, and, consequently, the properties of these austenitic steels vary greatly from those of steels of the ferritic type.

The iron-chromium-nickel alloys of the 18-8 group form a series of solid solution alloys which are noted for their great toughness and nonmagnetic properties. Alloys of the austenitic structure are always marked by a relatively low yield point with comparatively high tensile strength and very great ductility. None of these alloys can be hardened by heat-treatment, but they are readily hardened by cold working. Although the tensile strength of the annealed metal is only 80,000 pounds per square inch, the cold drawn and cold rolled alloys develop strengths of over 200,000 pounds per square inch with corresponding decreases in ductility.

The stability of the austenitic solid solution is affected by various heat treatments and cold working with the result that structural treansformations take place which must be considered in applying these alloys. In manufacturing, the greatest resistance to corrosion and the greatest toughness are obtained by heat-treating the finished article at temperatures between 1,850° F. and 2,100° F. Usually it is desirable to quench in water after heating to these temperatures, except for very light articles, which will cool rapidly in air. The higher the quenching temperature, the softer the alloy, and the coarser the grain of the austenite obtained. Experience gained during the last five years has indicated that quenching temperatures between 1,900° F. and 1,950° F. are most desirable for general purposes, and that the coarse-grained metal developed at higher quenching temperatures of around 2,100° F. is less desirable, particularly if the metal is subsequently to be exposed for long periods in service at temperatures above 1,000° F. It has furthermore been demonstrated that hot forged sections, on which the final forging work has been done above 1,800° F. do not require further heat treatment.

Cold-Working

When the 18-8 alloys are rapidly cooled from above 1,850° F. a homogeneous solid solution is obtained which consists solely of austenitic grains. Cold working of the metal so heat-treated effects a transformation of the austenite by separation of ferrite and possibly carbides in the cleavage planes of the crystals and grain boundaries, making the metal somewhat magnetic, and, in some instances, less resistant to corrosion. Material so worked can be restored to normal structure and softness by reheating at temperatures above 1,850° F. Cold working is also the only means of changing the grain structure of these alloys, as the metal does not recrystallize at definite temperatures as does regular steel, but recrystallizes only after the effect of severe cold working.

Investigation has also disclosed that the amount of carbon dissolved in the austenite varies with the temperature, and this phenomenon gives rise to profound effects which must always be considered. As a result, the carbon content of all 18-8 alloys which are used at elevated temperatures, is now kept below .07 per cent, the minimum carbon practicable in existing arc melting furnaces. Even with this slight amount of carbon, some carbides will be precipitated at certain temperatures since the solution of carbon in the austenite is unstable and the carbon solubility decreases as the temperature is lowered. Consequently, the reheating of these alloys, which have been quenched from above 1,850° F. to temperatures between 1,100° F. and 1,400° F. causes a gradual precipitation of carbides at the austenitic grain boundaries on long exposures. This transformation is very sluggish and occurs only over periods of several hundred hours. The extent of the change is also proportional to the carbon content of the material. For example, in 18-8 alloys containing .12 per cent carbon, the precipitation of carbides is rapid and the amount thrown out of solution is much larger than for alloys containing .07 per cent carbon maximum. In material which has not been cold worked, the precipitated carbides are found largely at the grain boundaries of the austenitic crystals and this causes a

marked decrease in the ductility and an increase in the corrosive attack in the grain boundaries. It is not possible to prevent the precipitation of the carbides but if these can be precipitated within the crystals (in cleavage planes), the ductility and corrosion resistance of the alloy are not impaired. Elements such as molybdenum and tungsten, which develop some ferrite in the structure, have been shown to produce some improvement, but insufficient work has been done to establish the degree of this benefit.

Titanium Additions

The 18-8 alloys containing about .50 per cent titanium have been studied very thoroughly in this country and in Europe for the last three years and it has been demonstrated that titanium additions completely retard the intergranular effects, if the metal is properly processed and heat-treated. The titanium alloy is therefore to be recommended for all installations operating above 1,200° F. and for all structures which require welding in assembling, since the titanium addition prevents the intergranular damage which arises from reheating of the metal adjacent to the weld. While no important installations of titanium 18-8 alloys have been made in refineries, some trial applications are under observation and the use of this special alloy in other industries has verified the promising results obtained in the laboratory.

The other chromium nickel alloys such as the 25 per cent chrome and 20 per cent nickel, 25 per cent chromium and 12 per cent nickel, etc., are similar to the 18-8 group in that they are ductile, nonmagnetic materials with an austenitic structure. Austenitic alloys show greater strength at high temperatures than the ferritic steels and, in general, as the chromium and nickel are increased (up to 30 per cent each) the strength, resistance to corrosion, and resistance to oxidation increase likewise. The higher chromium nickel alloys are more difficult to forge and are therefore not available in all commercial shapes. The austenitic alloys require similar heat treatments to the 18-8 alloys and also are impaired by the same carbide precipitation discussed previously.

The classification of the various metals discussed herein according to their resistance to corrosion, is a difficult task since so much data of a conflicting nature exist and also since some alloys are highly resistant to some corrosive media and are readily attacked by others. Laboratory tests show that the 4-6 per cent chromium alloys resist the action of such agents as aerated water, sea water, and weak hydrochloric and sulphuric acids, about two to five times as well as ordinary steels, while these same alloys resist high sulphur crude oils and hot hydrogen sulphide between 3 to 10 times as well as regular steels. Furnace tubes made of 4-6 per cent chromium alloy have given service of 15,000 to 20,000 hours.

Corrosive Resistance

The corrosive resistance of the higher chromium and chromium-nickel alloys is well described in existing trade pamphlets, and the superiority of these alloys has been well demonstrated in practically every industry. Figure 2 exhibits curves showing the corrosion resistance of a whole series of chromium alloys compared with regular steels. These curves are the results of tests of 15 different alloys subjected to four different conditions in at least 10 refineries, all specimens being suspended in actual operating units. The beneficial effect of increasing the chromium content is evident for each test condition.

Two of the most important properties of steels used in refinery service are their strength at high temperatures and their stability after long exposures to high temperatures. Engineers have developed two methods of testing metals in the laboratory in order to appraise the value of various alloys under stress at high temperatures. These are the so-called short-time, high temperature tests and the long-time flow, or creep tests. The short-time tests are carried out by heating the specimen to the desired temperature while it is held in the grips of the standard tensile testing machine, and then applying rapidly increasing loads until failure occurs, exactly as ordinary tensile testing is carried out at room temperature on all materials. In these short-time tests, the rate of loading is very rapid and the rate of elongation is also very rapid, the testing time usually not extending over a period of two minutes. Under these conditions, a rate of elongation as high as 50 per cent in 2 inches is carried out in a very short time. The tensile strengths recorded show gradually decreasing values as the temperature is increased, but are always very much higher than the loads which will produce flow in creep testing. Tensile strengths so determined give an indication of the stress which metals will sustain for short periods without failure when rapidly overloaded and also the approximate stresses which occur when apparatus is subjected to local overheating or overloading. Short-time tests are useful, therefore, as a qualitative indication of the relative strengths of various materials but give no idea of the load which a metal section can sustain at elevated temperatures for periods of 5,000 to 100,000 hours. Moreover, the existing data on the short-time high temperature tests of different steels reported by different investigators is highly conflicting, since the previous heat treatment of specimens and the rate of applying the loads have been far from consistent. For these reasons short-time tests are not generally considered a reliable basis for high temperature design.

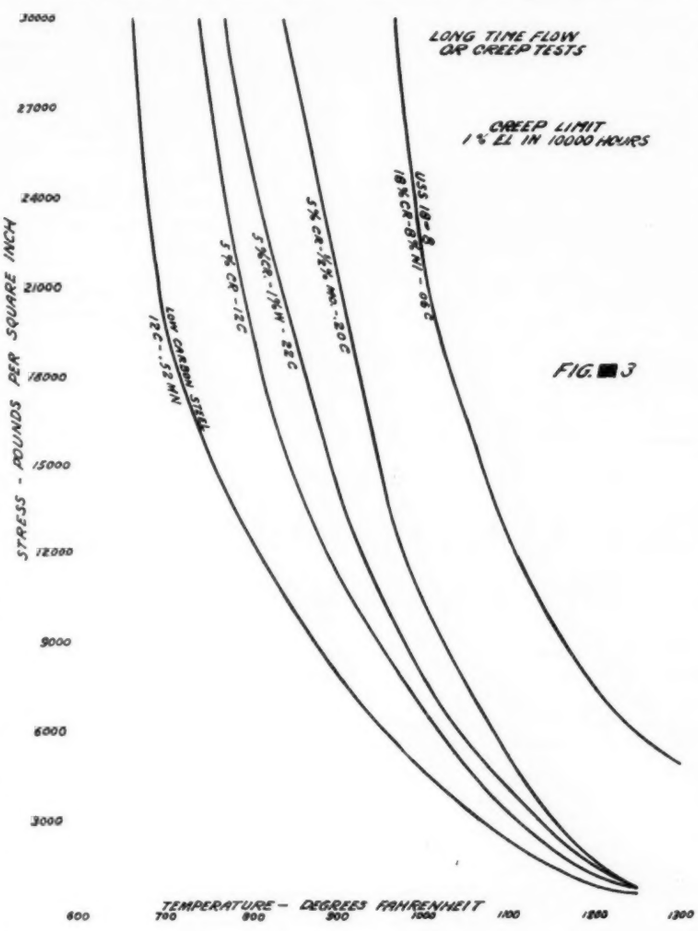


FIG. 3

Creep Testing Procedure

Creep testing procedure is much different from short-time testing, as the general practice in creep testing is to heat the specimen to a definite temperature and apply a definite and constant load. Under these fixed conditions the rate of elongation is measured at regular intervals and tests are extended to periods up to 100,000 hours. It has been found that, under static loads, metals flow at stresses which are far below the corresponding short-time strength at similar temperatures. This phenomenon of the creep of metals has given designing engineers considerable difficulty, as the stresses which can be applied in service for long periods must be quite low. Since creep tests results are dependent upon time, temperature and stress, it is necessary to specify a creep stress as that which will produce a certain flow in a definite time. Usually the load which will produce less than 1 per cent elongation in 10,000 or 100,000 hours at any given temperature is designated as the creep stress, or limiting creep stress, it being inferred that, under this load, the metal wil remain rigid for an indefinite period. Unfortunately, for engineers, a number of investigators have attempted to determine the flow characteristics of metals by a number of short-cut methods and, as a result, the literature on this subject is cluttered with a mass of data which cannot in any way be correlated. The use of such expressions as "limit of viscosity," "proportional limit," "time yield," "stress limit for no creep," "stress corresponding to 1 per cent elongation in 10,000 hours," and many others as means of reporting the creep properties of different metals, has greatly clouded the issue since all of these definitions are different. In the United States, engineers, up to this time, have preferred to discuss creep strengths only when referring to tests lasting at least 5,000 hours, in order that the time element, which is vital, may be accurately evaluated.

In spite of the considerable expense and effort which have gone into creep testing during the last 10 years, it will be evident that the results obtained can only be construed after careful survey of the testing procedure. The "accuracy" of any creep data presented will, therefore, depend upon the base to which the tests are referred. In Figure 3 are submitted curves showing the relative "creep limits" for 1 per cent elongation in 10,000 hours for several steels discussed in this paper and widely used in refineries. The data represented in these curves originated in three independent laboratories and each curve is, therefore, a composite of results. All of these tests were carried out for at least 5,000 hours and the results are believed to represent a reliable comparison of the relative flow characteristics of the steels included in the chart. It is also believed that practical experience in service will place the same metals in similar relation as regards strength.

Structural Stability

The structural stability of metals exposed to long periods at high temperatures is a vital factor in determining their adaptability to any certain service. A change in metal structure during service may alter metal volume and dimensions, reduce the strength and ductility, and alter the resistance to corrosion. It is, therefore, important to know what structural transformations may occur and to determine their effects. Usually, by suitable preheat treatments, it is possible to place the metal structure in equilibrium with operating conditions and thus inhibit further structural changes. The usual effect of long-time high temperature service is similar to annealing, since changes occur after long periods at relatively low temperatures (900° F. to 1,400° F.), which occur rapidly in annealing in the ordinary critical ranges of most steels. It, therefore, follows that all metals used at high temperatures should be fully annealed before being installed, as otherwise the metal will be annealed in service. Those steels which are susceptible to hardening by quenching and drawing should not be used in the heat-treated condition at temperatures above 900° F. since the long exposure to such temperature will completely obliterate all hardening effects. This applies particularly to the 4-6 per cent chromium alloys since these are so readily hardened, but even .15 per cent carbon boiler steel will show a transformation from the normalized structure to one containing spheroidized carbides, indicating complete transformation of the normal pearlite. This change is even more pronounced in the higher carbon steels and the pearlitic steels of the S.A.E. series such as chrome-vanadium, chrome-molybdenum, etc. In this connection, the testing of alloys for high temperature properties, either short-time or creep tests, should be made only on fully annealed specimens in order that the tests may approximate the condition of the metal after long periods in service.

This brief paper will indicate some of the strides which have been made by the steel and oil industries in developing and applying special materials during the last five years. The progress thus far represents only a beginning. At the present time, a whole series of lower cost alloy steels, such as carbon-molybdenum, carbon-tungsten, chrome-molybdenum, tungsten and vanadium are under study, but it is too early to predict the possibilities. Continued investigation of intermediate chromium steels, and of stainless steels, may also be expected. Along with better knowledge of the properties of these alloys will also come improved technique in the manufacture and fabrication of equipment.

MOTOR FUEL PATENT

YONKERS, N. Y., Oct. 3. — Dr. Joseph G. Davidson, formerly of this city, has been awarded a patent for a new motor fuel, composed of gasoline and other chemicals and claimed to have diminished evaporation and less detonation than any other fuels now in use. He has assigned manufacturing rights to the Carbide & Carbon Chemicals Corp. of New York.

SAMUEL A. MEGEATH DEAD

Samuel A. Megeath, 62, former president of the Galena Oil Co., died on Sunday, September 25, at his Long Island, N. Y., home.

He is survived by his widow, the former Adelaide Miller of Franklin, Pa., and five children.

Mr. Megeath was a native of Baltimore, Md., and a former resident of Franklin, Pa.

Approve Antiknock Gasoline Test Method

(Continued from Page 16)

of the co-operating laboratories had previously found to be effective in modifying knock ratings, were selected; specifically, engine speed, mixture temperature, jacket temperature, throttle opening, valve timing and piston temperature. A study was made of the effect upon road-test correlation of changes in each of these variables, both singly and in various combinations.

Seven C.F.R. engines were placed at the disposal of the committe at the Waukesha Motor Co.'s laboratory. Five of these engines were kept running constantly testing various modifications in the C.F.R. procedure. During the two and one-half weeks of test work, 68 modifications in procedure and approximately 650 individual knock ratings were made.

These tests constituted the major portion of the work, and as a result the following method was recommended as the most satisfactory from the standpoint of accomplishing good correlation with road ratings and without the attendant disadvantages of ethylene-glycol cooling which was included in the only suitable alternative method found:

C.F.R. Motor Method

The new C.F.R. Motor Method differs from the older method, now to be known as the C.F.R. Research Method, in five

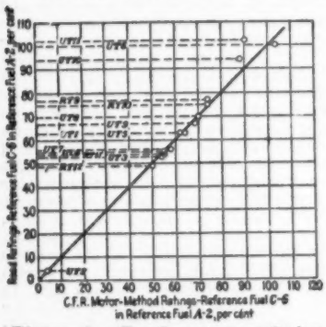

Road Ratings-Reference Fuel C-6 in Reference Fuel A-2, per cent
C.F.R. Motor-Method Ratings-Reference Fuel C-6 in Reference Fuel A-2, per cent

Figure 2—Road test correlation with C.F.R. engine ratings determined under C.F.R. research method. Test conditions: Speed, 600 r.p.m.; jackets, 212° F.; carburetor set for maximum knock; spark timing, 22.5° at 5:1; wide open throttle

respects. It will be noted that the features of the new method as stated herewith involve certain definite changes in equipment and procedure. With the exception of these items listed below, the apparatus and procedure are essentially as published in the S.A.E. Journal for August, 1931, and in use as the C.F.R. Research Method.

1. Speed: 900 r.p.m.

2. Mixture temperature: 300° F.; heat applied by an electric heating-unit placed between the carburetor and the intake port; the mixture temperature to be measured by a mercury thermometer whose bulb is placed in the center of the mixture stream entering the inlet port.

3. Spark timing: 26 degrees before top center at 5:1 and following the present timing mechanism at other compression ratios.

4. Shrouded intake-valve.

5. An improved type of steam condenser and elimination of the circulating pump.

Further in making the specified changes in equipment it is absolutely necessary that every new part of the equipment, including the complete electric heater, thermometer, shrouded intake-valve, and condenser and water connection to replace the circulating pump, should be specifically those manufactured for this purpose by the Waukesha Motor Co.

Figure 3 shows the correlation between road ratings and ratings on the C.F.R. engine determined by this modified procedure. Table 1, giving the summary of ratings on the fuels tested at Uniontown, indicates clearly the almost perfect correlation between the road ratings of the fuels and the laboratory ratings according to the modified procedure, now termed the C.F.R. Motor Method, and shows the degree of improvement in this correlation

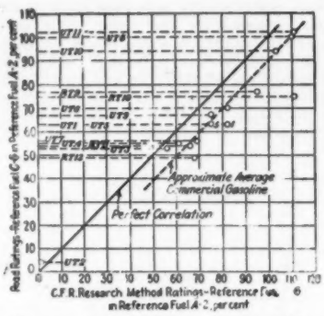

Approximate Average Commercial Gasoline
Perfect Correlation
Road Ratings-Reference Fuel C-6 in Reference Fuel A-2, per cent
C.F.R. Research Method Ratings-Reference Fuel C-6 in Reference Fuel A-2, per cent

Figure 3—Road test correlation with C.F.R. engine ratings determined under C.F.R. motor method. Test conditions; Electric mixture-heater No. 2, mixture, 300° F.; speed, 900 r.p.m.; jacket, 212° F.; carburetor set for maximum knock; spark timing, 26° at 5:1; wide open throttle

over the ratings as obtained by the previous method, that is, the C.F.R. Research Method.

Furthermore, the operating group, in rendering its report to the detonation subcommittee, expressed the belief that these modifications in the C.F.R. apparatus and procedure not only give better correlation with the actual performance tests than the former C.F.R. procedure, but the modified procedure will enable knock ratings to be made with greater speed and accuracy than heretofore.

Acting upon the report of the operating group and the recommendation of the detonation subcommittee, the co-operative fuel-research steering committee, at its meeting on September 12, officially approved this modification of the knock-testing procedure, to be known thenceforth as the C.F.R. Motor method.

The steering committee also approved the suggestion of the detonation subcommittee that the C.F.R. method should not be discarded, since it is one on which considerable experience and data have been obtained and undoubtedly has value from the experimental standpoint, but should be retained under the title, C.F.R. Research Method.

DEATH OF J. H. KOCH

Jeremiah H. Koch, 78 years old, died at his home in West Union, W. Va., Sunday, September 25. Mr. Koch in his younger days was one of the most important oil operators in the Clarion, Pa. Field., moving from there to the Bradford Field where he took an active part in the developments. Later he returned to Clarion County. Thirty years ago he entered the service of the Carter Gas Co. in West Virginia and was superintendent of that company up to a decade ago when he retired.

Osage Leases Bring $11.81 Per Acre With a Minimum of 31 Cents

The auction sale of oil leases on Osage Indian lands, held in Pawhuska, Okla., on Wednesday, September 28, brought a total of $101,370 in bonuses to the Osage tribe. The tract bringing the largest sale price was the NE, Section 28-24-7, for which the Lewis Production Co. paid $23,000. Many of the tracts went for $50 each. The average price paid per acre was $11.81.

Following is a list of the sales:

Tract No.	Description	Acres	Purchasers—	Bonus
1	SE 5-21-12	160	C. M. Peterson, Tulsa	$ 50
2	SW 5-21-12	160	C. M. Peterson, Tulsa	50
3	NW 8-21-12	160	C. M. Peterson, Tulsa	50
4	NE 18-26-12	160	W. H. Tyman et al, Bartlesville	50
5	NW 18-26-12	160	L. G. Stanley, Tulsa	300
6	SE 19-20-11	160	J. H. Higgins	75
7	SW 1-23-11	160	J. V. Dunbar, Muskogee	50
8	SE 34-27-11	160	Norbia Oil Co., Tulsa	75
9	NE 25-26-10	160	Passed	
10	NW 25-26-10	160	Passed	
11	SE 21-22-9	160	Passed	
12	SW 21-22-9	160	Passed	
13	SE 28-22-9	160	National Ref. Co., Cleveland, Ohio	50
14	NW 33-22-9	160	J. R. Higgins, Tulsa	50
15	NE 16-23-9	160	R. J. Barritt, Pawhuska	75
16	NW 16-23-9	160	National Ref. Co., Cleveland, Ohio.	225
17	NW 23-23-9	160	National Ref. Co., Cleveland, Ohio.	200
18	SE 3-26-9	160	National Ref. Co., Cleveland, Ohio.	775
19	SW 3-26-9	160	National Ref. Co., Cleveland, Ohio.	100
20	SW 34-26-9	160	L. G. Stanley, Pawhuska	100
21	NW 18-22-8	160	O. E. Stoner, Tulsa	50
22	SW 18-22-8	160	O. E. Stoner, Tulsa	50
23	SW 3-23-8	160	E. G. Todd, Cleveland, Okla.	50
24	SW 21-24-8	160	Passed	
25	SW 30-24-8	160	Bay Oil Corp., Tulsa	1,000
26	NE 12-23-7	160	Continental Oil and Gypsy Oil Co.	12,500
27	*SE 12-23-7	160	Continental-Gypsy	8,000
28	*SE 14-23-7	160	L. R. Stith, Tulsa	100
29	*NW 21-24-7	160	Lewis Production Co., Tulsa	1,500
30	*SW 21-24-7	160	Lewis Production Co., Tulsa	3,000
31	*NW 24-24-7	160	Norbia Oil Co., Tulsa	1,000
32	SW 24-24-7	160	Champlin Oil Co., Enid	1,050
33	SE 25-24-7	160	Bay Oil Corp., Tulsa	11,500
34	*NW 27-24-7	160	Lewis Production Co., Tulsa	8,800
35	*NE 28-24-7	160	Lewis Production Co., Tulsa	23,000
36	NE 29-24-7	160	Continental-Gypsy	2,700
37	NW 29-24-7	160	A. H. Kasishke, Tulsa	575
38	SE 29-24-7	160	A. H. Kasishke, Tulsa	1,250
39	NE 36-24-7	160	Bay Oil Corp., Tulsa	15,000
40	NE 19-25-7	160	National Ref. Co., Cleveland, Ohio.	200
41	NW 19-25-7	160	Ohio-Osage Oil Co., Bartlesville	75
42	NW 28-28-7	160	Bay Oil Corp., Tulsa	50
43	SW 19-23-6	160	Deep Rock Oil Corp., Tulsa	50
44	NW 30-23-6	160	Deep Rock Oil Corp., Tulsa	50
45	SE 3-25-6	160	Norbia Oil Co., Tulsa	50
46	SE 5-25-6	160	C. W. Titus Co., Tulsa	2,500
47	NE 8-25-6	160	C. W. Titus Co., Tulsa	3,000
48	NE 10-25-6	160	Norbia Oil Co., Tulsa	250
49	NE 11-25-6	160	Norbia Oil Co., Tulsa	50
50	NW 11-25-6	160	R. J. Barritt	100
51	*SW 15-25-6	160	A. H. Kasishke, Tulsa	500
52	SW 16-25-6	160	H. F. Worley, Tulsa	350
53	SE 22-25-6	160	T. T. O'Herin, Cushing	50
54 Fr.	SE 24-23-5	55.65	Deep Rock Oil Corp.	50
55 Fr.	NE 25-23-5	47.15	Deep Rock Oil Corp.	100
56	SE 23-28-5	160	Bay Oil Corp., Tulsa	50
57	SW 23-28-5	160	Bay Oil Corp., Tulsa	50
58	NE 26-28-5	160	Bay Oil Corp., Tulsa	50
59	NW 26-28-5	160	Bay Oil Corp., Tulsa	50
Total sold		8,582.80	Total	$101,370

*Tracts to be drilled within 12 months from approval of lease.

Relation Between Imports, Exports Better in August

(Continued from Page 27)

1931, totaled 1,804 bbls., valued at $12,120, free of duty, compared with 1,169 bbls., valued at $7,849, dutiable in August, 1932.

Lubricating oil imports in August became negligible, declining from 3,440 bbls., valued at $56,477, free of duty, in August, 1931, to 149 bbls., valued at $3,453, dutiable in the same month of this year.

Paraffin and paraffin wax imported free of duty in August, 1931, totaled 3,025,992 pounds, valued at $107,725, declined to 1,814,692 pounds, valued at $55,808, dutiable in the same month of this year.

Exports of crude petroleum during August, 1931, totaled 2,856,546 bbls., valued at $1,942,849, showing a negligible decline in quantity and a great increase in price when compared to the exports of August of this year, when the quantity was 2,839,425 bbls., valued at $2,918,119.

Exports of natural gasoline during August totaled 8,018 bbls., valued at $9,309, with no exports of this product of record for August, 1931.

Refined oils declined in exports from 8,092,921 bbls., valued at $19,431,370, in August, 1931, to 5,078,340 bbls., valued at $13,518,546 in August, 1932.

Exports of gasoline, naphtha and other finished light products declined from 4,036,199 bbls., valued at $8,758,292, in August, 1931, to 2,259,856 bbls., valued at $5,636,310, in the same month of this year. Of the quantity exported in August of this year, 2,164,680 bbls. was shipped in bulk and 95,176 bbls. in containers.

Exports of illuminating oil declined from 1,131,153 bbls., valued at $2,893,475, in August, 1931, to 998,453 bbls., valued at $2,124,466, in the same month of this year.

Gas oil and distillate fuel oil exported in August, 1931, totaled 2,066,910 bbls., valued at $1,785,828, declining to 568,903 bbls., value at $719,361, in August of this year.

Exports of residual fuel oil in August totaled 591,591 bbls., valued at $448,075, with no record of such exports for the previous August.

Fuel or bunker oil for vessels in foreign trade (not included in domestic exports) shows a decline from 3,442,020 bbls., valued at $2,868,667, in August, 1931, to 3,065,789 bbls., valued at $2,626,549, in the same month of this year.

During August, American vessels took 1,400,097 bbls., of this oil, foreign vessels taking 1,665,692 bbls.

Lubricating oil exports declined from 848,951 bbls., valued at $5,887,177, in August, 1931, to 649,083 bbls., valued at $4,494,154, in August of 1932. Of the total quantity exported in August, 1932, 432,535 bbls. were red and pale, 45,308 bbls. black and 171,240 bbls. cylinder oil.

Exports of insulator transformer oil showed an actual increase compared with the previous August. The quantity in August, 1931, was 4,477 bbls., increasing to 7,604 bbls. in the same month of this year.

Exports of mineral spirits decreased from 4,485 bbls. to 2,606 bbls. and light lubricating oils in small packages decreased from 746 bbls. in August, 1931, to 244 bbls.

Lubricating greases showed a comparatively small decrease from 6,030,941 pounds to 5,344,155 pounds.

There was also a small decrease in the export of paraffin wax from 20,908,945 pounds, valued at $632,323, in August, 1931, to 19,100,237 pounds, valued at $516,344, in the same month of this year. Of the quantity exported in August, 5,190,521 pounds were unrefined and 13,909,716 pounds were refined.

Petroleum asphalt exports were cut in half, dropping from 21,986 tons, valued at $418,458, in August, 1931, to 10,594 tons, valued at $182,897, in the same month of this year.

Petroleum coke exports increased from 3,721 tons in August, 1931, to 11,023 tons in August of this year.—C. E. K.

SERVICE ON NEW FIELDS

THE PERRY FIELD IN SOUTHERN NOBLE COUNTY, OKLAHOMA

Compiled by The Oil and Gas Journal, October 1, 1932

LOCATION OF FIELD

The Perry oil and gas field, in southern Noble County, Oklahoma, is composed of two oil pools, one of which is new, and one gas pool. The oil pools are in Townships 21-2w and 20-2w and the gas production is in Township 21-1w, lying respectively west, southwest and south of the city of Perry, county seat of Noble County, and containing 4,500 inhabitants. Perry lies south of the Tonkawa Field, which extends from the northern part of Noble County into southern Kay County.

Geographical position.

The Perry Field is in north central Oklahoma and in a part of the state where only high-gravity oil has been produced. It has for its neighbors the famous Garber, Billings and Tonkawa Pools. Perry is about 90 miles west and a little north of Tulsa; about 65 miles north and a little east of Oklahoma City, and about 100 miles south of Wichita, Kans.

Highways.

Perry, and all the three pools in the field, may be reached by good highways. U. S. Route 64, which traverses northern Oklahoma, entering the east side of the state from Arkansas, and U. S. Route 77, which extends from the Gulf of Mexico to Canada, pass through the city. The new pool in Township 20-2w is 4 miles west of Route 77, and the good road from the main highway to the scene of operations in the new pool, is being improved by the Noble County commissioners who are having it surfaced with gravel to put it in all-weather condition.

Railroads.

The Atchison, Topeka and Santa Fe division from Kansas City to the Gulf of Mexico and the St. Louis & San Francisco Railroad's division from Tulsa to Avard, Okla., pass through Perry, and all through trains make regular stop at that city.

Cities and towns with supply houses.

Thus far the nearest supply houses are in Tonkawa and Blackwell, Okla., north of the field, on the Santa Fe Railroad and on Route 77.

Type of country.

Noble County is in the great Oklahoma wheat belt and dairying is also a thriving industry. The rainfall is frequent and plentiful. The surface is flat. The farms are held mostly in 160-acre tracts.

Types of sites available for supply houses.

Sites for supply houses are available in Perry.

Trucking and hauling facilities available.

Trucking and hauling facilities will depend upon the extent of development work following the completion of the discovery well in the pool in Township 20-2w. They will be easily available when there is need for them.

Hotel and other accommodations.

Hotels and restaurants in Perry are the nearest to the new pool.

Electric power and gas companies.

Gas and electric power, heat and light are at hand. The Apache Gas Co. is the distributing company in Perry with a large supply to draw from just south of the city. The Cities Service Gas Co. is in a position to supply gas for field operations and the Oklahoma Gas & Electric Co. has high-powered lines in the area.

Schools and churches.

Perry has churches of the leading denominations, and good public and parochial schools.

GEOLOGICAL DATA

In the December, 1931, bulletin, American Association of Petroleum Geologists, Dr. John L. Rich, University of Cincinnati, Cincinnati, Ohio, gives a very complete review of the general geology of the Granite Ridge pools of Kansas and Oklahoma, extending from Florence, Kans., southward into central Oklahoma with the Oklahoma City Field at the south end. The areas described include the fields of Florence, Peabody, Elbing, El Dorado, Augusta, Blackwell, South Blackwell, Tonkawa, Garber, Lowell, Marshall and Oklahoma City, all of which have similar geological structure.

From the records so far available on L. H. Wentz and others' No. 1 Wolff, Section 17-20-2w, it seems to follow the same geological conditions and is in the trend of this production and has all the characteristics of another Granite Ridge Pool.

It is therefore quite probable that the general geologic history of the region as given by Rich and other geologists whom he cites in his article will apply to this area, although the specific details of this particular well may differ slightly from the other fields.

The lowest member of the series of formations covering this area is known as the Arbuckle limestone(called Siliceous lime by drillers). This formation was deposited on all those parts of Oklahoma and Kansas with which this general geology will deal. Deposition of the Arbuckle seems to have begun in southern Oklahoma where it is now thickest and whence it seems to have spread northward and northwestward.

Later, the region was uplifted and for a long time the Arbuckle limestone floored a low land, at least in the northern half of the area. Still later, near the close of the Ordovician, this land was submerged and the sediments of the Simpson formation, a series of shales, thin dolomites, and extensive sheet sandstones, were deposited.

Its principal sheet sand, the "Wilcox," which seems to correspond with the St. Peter sandstone of adjacent states, is now the most prolific oil-producing sand in the district. The Simpson formation and its sands were thickest in southern Oklahoma and considerably thinner in northern Oklahoma and southern Kansas, but, so far as known, they once covered all of the area under consideration.

Simpson deposition was followed by a period of slight emergency, after which the region again sank and the Viola limestone, approximately 50 feet thick, the Sylvan shale, or upper Ordovician age, 75-125 feet thick, and the Hunton limestone, representing part of Siluro-Devonian time, were deposited, evidently throughout the whole region.

The deposition of the Hunton limestone was followed late in Devonian time by uplift, broad warping, and extensive peneplanation during which, on the Chautauqua arch in southeastern Kansas and the Barton arch in west-central Kansas all of the formations down to and including part of the Arbuckle limestone were removed by erosion. The peneplaned surface thus formed seems to have been extremely flat.

Early in Mississippian time this broad, flat plain was submerged and the dark, organic muds which formed the Chattanooga shale were deposited with remarkable uniformity throughout the whole region. The Chattanooga, notwithstanding its wide extent, is comparatively thin, ranging from only a few feet to slightly more than 200 feet, but having an average thickness between 20 and 50 feet in the area.

Deposition of the Chattanooga shale was followed conformably by that of the "Mississippi lime" which also is characterized by remarkable uniformity in large areas. Its average thickness was at least 350 feet. How much more it may have been and how great a thickness of later Mississippian rocks may once have been present and have been eroded is not known.

The deposition of the "Mississippi lime" was followed during the later part of Mississippian or the early part of Pennsylvanian time by another uplift which seems to have been slight in amount and uniform in large areas, for the Mississippian rocks were eroded at the top and slightly beveled, and a topography of low hills and valleys were developed on them in most of Kansas and the greater part of northern Oklahoma, but only here and there did erosion cut down entirely through the formation. The remaining lower part of the "Mississippi lime" has a remarkably uniform thickness ranging from 200 to 350 feet in large areas.

In contrast to the slight, uniform regional uplift of most of the area at this period, was the sharp linear folding and faulting which produced the Granite Ridge (Nemaha Mountains) of Kansas and the related structure farther south and southeast. Whether this sharper local folding and faulting

BRIDGEPORT
COMPLETE ROTARY SERVICE *for the* NEW PERRY FIELD *from Two Near-by Stores*

Bridgeport is ideally located and equipped to properly take care of the new Perry field, on either new or used equipment. Our large branch at Oklahoma City is only about 70 miles to the south—our complete shops and well-stocked warehouses at Wichita only about 100 miles to the north. Collect phone calls will have immediate attention, night or day. Fast deliveries by truck, rail or express.

BRIDGEPORT OFFERS YOU LOWER PRICES, BETTER SERVICE, FASTER DELIVERIES.

DRILL COLLARS

Bridgeport manufactures Drill Collars, and carries them in stock in 6, 10, 12, 24 and 30-foot lengths, all sizes, with either steel or bronze boxes. Prices lower than competition; quality positively guaranteed the best. We occasionally offer good used drill collars. Now have on hand several 6-foot, also

1 — 8" — 30' — **$350.00**
1 — 9" — 30' — **$400.00**

ROTARY REAMERS

Bridgeport Reamers have proved their value. Every size on hand, ready to go. Side reamers always on hand. You can't afford to buy without getting Bridgeport prices. A few 11, 12 and 12½ on hand, regular design and high quality, but not our very latest type.

SPECIAL DISCOUNT OFFERED OF 20%

We also carry other standard makes of reamers, along with parts. Quick shipments.

GUARANTEED SHOPWORK

Bridgeport shops at Wichita are fully equipped with the latest type of electric driven machinery to handle any kind of manufacturing and repair work. No job is too small—none too large. Hollow spindle lathes, modern milling machines and Turret Lathers are at your service in our shops, with expert operators always on hand. We are best equipped to handle all kinds of forging, heat treating, joint turning, electric or acetylene welding, bronzing and general overhauling of engines, pumps, etc. Fast service always.

ROTARY EQUIPMENT (Used)

We offer immediate delivery on practically all kinds of guaranteed units used in Rotary Drilling. Now have on hand for immediate shipment

8" Johnson Rotary Table
18" Mud Pumps (Johnson or Lucey)
12 x 12 Johnson Engine
All sizes Boilers

Mid-Continent Distributors for AQUAGEL & BAROID Oldest and Best Known Drilling Muds

Complete stocks carried at all Bridgeport Branches. Wire or phone us your order collect—or write us for full information and booklet. Your supply dealer can also furnish you this material.

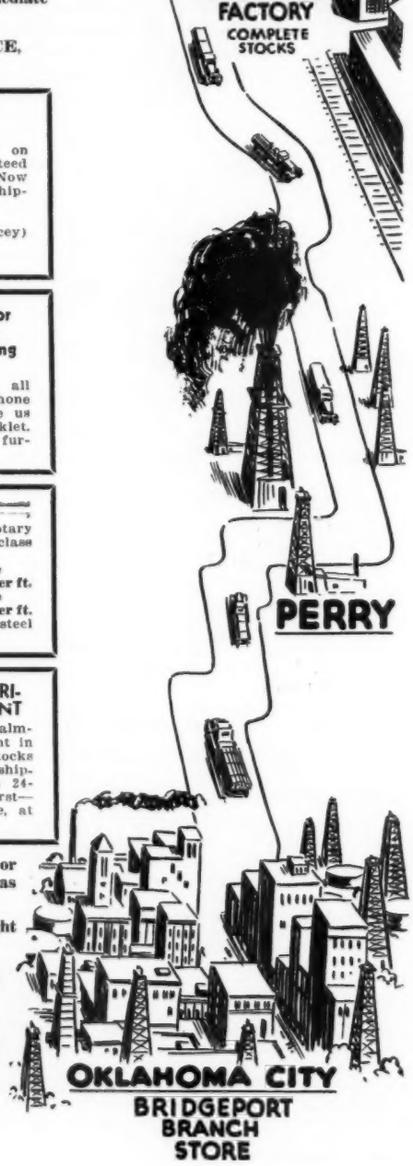
ROTARY HOSE

Bridgeport has developed rotary hose to a point where users class it as "Just about Perfect!"

Best grade 2½" Rotary Hose (Never a failure).... **$5.75 per ft.**
Regular grade (former price $5.00 per ft.) ..... **3.50 per ft.**
Also have attractive prices on steel hose.

ALLIS-CHALMERS ELECTRICAL OIL FIELD EQUIPMENT

Bridgeport distributes Allis-Chalmers electrical oil field equipment in the Mid-Continent. Complete stocks on hand ready for immediate shipment, backed by Bridgeport's 24-hour service. Get our prices first—call us collect, from anywhere, at any time.



Bridgeport manufactures and distributes everything needed in Rotary or Cable drilling; also carries large stocks of used equipment, and pipe, as well as everything needed in operating an oil lease.

Nearly every item used, in stock, Very attractive prices. Call collect, night or day.

BRIDGEPORT MACHINE COMPANY
Wichita, Kansas

Branches Conveniently Located in All Active Mid-Continent Oil Fields

SERVICE ON NEW FIELDS

The Perry Field in Southern Noble County, Oklahoma

(Continued from Preceding Page)

occurred at the beginning of the late Mississippian uplift, during it, or near its close is uncertain, but the last seems most probable.

Along these sharper folds and faults the "Mississippi lime" and older formations were brought up above peneplain level and stripped well down into the Arbuckle limestone on the Oklahoma structures and down to and into the pre-Cambrian on the Granite Ridge north from the vicinity of El Dorado, Kans.

The interesting feature of this wildcat well which proved the structure was the fact that both the Mississippi lime and the Chattanooga shale were missing. In taking the average thickness of these formations, approximately 300 feet on an average, this well was found to be that much higher than other tests drilled in the vicinity.

DEVELOPMENT

Discovery of field.

The new field was discovered and opened by the completion of an oil well, L. H. Wentz and others' No. 1 Wolff, C SE NW Section 17-20-2w, located in Noble County, 14 miles southwest of Perry, the nearest city. The test had a showing of oil on September 19 in the top of the Simpson sand. It was then drilled deeper and the casing landed and cemented and after a swabbing test it was decided to drill it deeper again to the present total depth of 5,197 feet, where it started flowing on September 28, producing 110 bbls. the first 20 minutes and 1,817 bbls. the first 24 hours. The well is located on a 2,160-acre unitized block of acreage, in which eight different companies are interested. This well is the first wildcat to create general interest in Oklahoma since the discovery of the Oklahoma City Field in December, 1928.

Analysis of Crude Oil

Analysis	Crude oil	
From	Wentz and others' No. 1 Wolff, Noble County. Oklahoma, Section 17-20-2w.	
Made by	Ginter Chemical Laboratory, Tulsa, Okla.	
Method	Dry distillation	
Color	Green	
Odor	Sweet	
Sulphur	0 21 per cent	
Gravity A.P.I.	41 8	
	Per cent	Gravity
Gasoline	40 33	61.5
	Initial 100° F. Endpoint 404° F.	
Kerosene	16.70	41.0
Residue	41.90	27.3
	Color—Good. Viscosity at 130° F., 135 Sec. S. U. Pour test, 35° F.	
Loss	1.07	
Total	100 00	

Development subsequent to discovery of field.

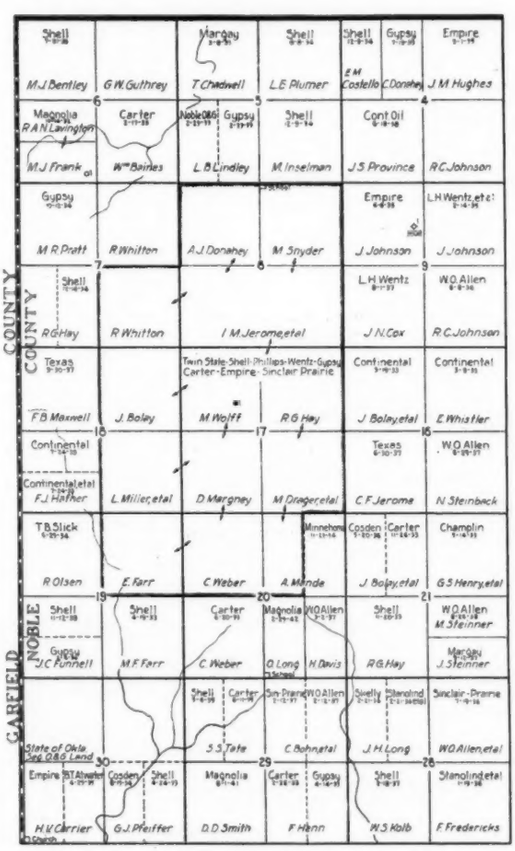
Like most of the other fields in that part of the state, early development was disappointing. With the exception of the discovery well only two shallow wells have been drilled in the townsite and these were drilled a number of years ago and very little is known about them. The Empire Oil & Refining Co. drilled in the SE cor. NE NW Section 9-20-2w to a total depth of 3,508 feet in 1919. The maps also show another hole drilled in the NW cor. SE NW Section 9-20-2w to a total depth of 2,180 feet, but as neither of these tests found any showings of oil or gas the territory was overlooked for years. In the township to the north the Bu-Vi-Bar Petroleum Co. drilled a well in the C SW SW Section 15-21-2w to a sand at 1,902-12 feet, where it made 130 bbls. of oil when first completed in April, 1925. The Bu-Vi-Bar Petroleum Co. sold the property to the Magnolia Petroleum Co. This well led to a number of others being drilled in the vicinity, some of which were dry holes. Then the Bu-Vi-Bar company obtained additional acreage nearby and made a deal with the Magnolia company for a two-thirds interest to the latter company in exchange for a deep test. The Magnolia Petroleum Co. completed the first Wilcox sand well in the area in July, 1930, No. 4 Sams, SE cor. SW SW Section 15-21-2w, which made 250 bbls. of oil at 5,135-95 feet. This oil tested 41 gravity A.P.I. Following the completion of this well, No. 2 Weeder, SW cor. NW NE Section 22-21-2w, was drilled to a total depth of 5,3'0 feet, where it was completed as a dry hole in November, 1930. In July, 1931, the company drilled another dry hole to the Wilcox sand in the SW cor. SE Section 16-21-2w, to a total depth of 5,330 feet. The same year the Magnolia and Bu-Vi-Bar companies completed No. 1 Roberts, SE cor. NE SE Section 21-21-2w, as a dry hole at a total depth of 5,302 feet. They were more successful in 1932. In January No. 2 Young, NW cor. SW NW Section 21-21-3w, was completed for 40 bbls. of oil from the Wilcox sand at 5,215-20 feet. The best wells yet completed in the field were the Magnolia-Bu-Vi-Bar's No. 1 Wooleson, NE cor. SE NE Section 21-21-2w, which was completed in August, 1932, for 370 bbls. of oil from the Wilcox sand at 5,219-33 feet, and the same companies' No. 1 Young, NE cor. NW NW Section 22-21-2w, which was completed for 290 bbls. of oil from a total depth of 5,119 feet in the Wilcox sand. These wells are located about 6 miles northeast from Wentz and others' No. 1 Wolff, and were the first Wilcox sand wells in the area. It is believed that this production led to the exploration of the new producing area to the southwest.

Number of operations October 1.

While there are no new rigs up as yet it is expected that it will only be a short time until the three offsets are started. Wentz and others' well has been watched closely and companies with acreage outside of the block no doubt will start some tests.

Future activity.

The area immediately surrounding the well is in the unitized block where it is believed that development will be carried on conservatively and systematically. To the north of the well there are several leases that expire in the first part of 1933 which no doubt will be drilled in order to protect the owners' interests. Just what may be expected in the area outside of the unitized block is anybody's guess. If this pool should cover a large area a boom may develop in the territory adjoining the block. The unitized block will be drilled in a manner to meet the market and individual requirements of the different operators. The location of the block is such that the discovery well may be the forerunner of a general wildcat p'ay in that part of the state on south to the Oklahoma City Field.



Acreage close to Wentz and others' discovery well in Section 17-20-2w

(To be continued in The Oil and Gas Journal, October 13, 1932)

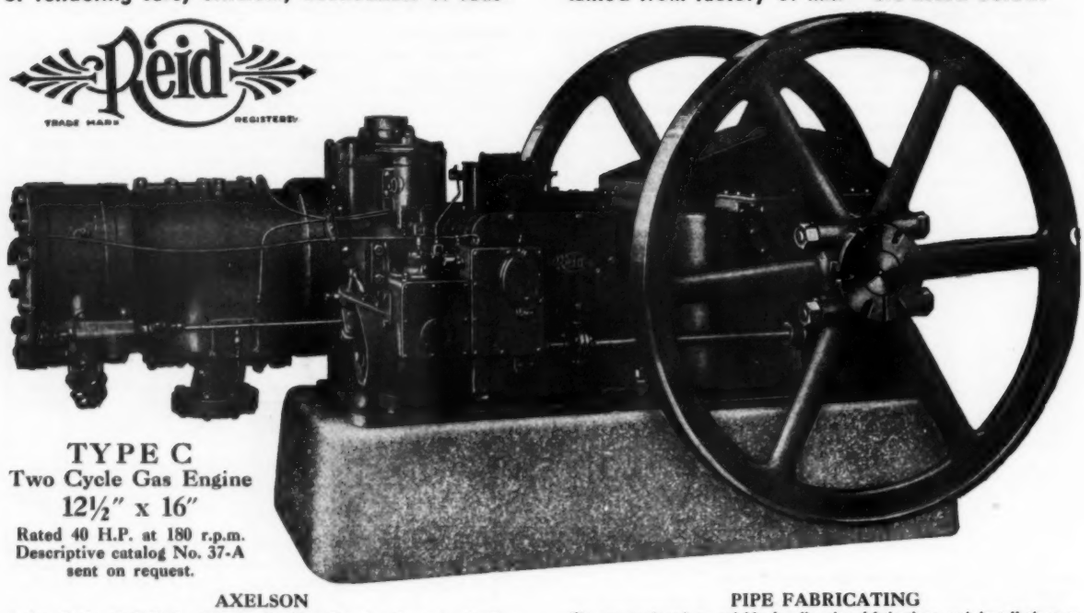
FRICK-REID's

adherence to QUALITY PRODUCTS

●As a supply organization serving the equipment requirements of the Oil and Gas Industry, FRICK-REID has steadfastly refused to jeopardize their reputation as distributors of "QUALITY PRODUCTS" by attempting to sell, even during the last few years of unfortunate business recession, materials or equipment of doubtful merit—made to sell at a low price—and frequently incapable of rendering safe, efficient, economical or satisfactory performance when placed in service. Serving newly discovered and old fields alike, the FRICK-REID Organization offers the Petroleum Industry every facility for readily securing supplies or equipment needed for economical development and operation of properties.

A few of the manufacturers whose Quality Products are handled at our stores—or quickly obtained from factory or mill—are listed below:

Reid
TRADE MARK REGISTERED



TYPE C
Two Cycle Gas Engine
12½" x 16"
Rated 40 H.P. at 180 r.p.m.
Descriptive catalog No. 37-A sent on request.

AXELSON
Sucker Rods; Pull Rods; Plunger Working Barrels (Pumps); Stuffing Boxes; Portable Pipe Threader and Cutter.

BEAUMONT
Dreadnaught Water Cooled Drawworks; Timken Bearing Equipped Crown, Traveling and Tubing Blocks; Pumping Hoists; Bailing Line Reels; Steel Walking Beams; Casing Shoes; Anchor and River Clamps; Pitmans; Flow Line and Christmas Tree Fittings. Self contained Pumping Units, Tubing Heads—Types for every field.

BLAW-KNOX
Gas Cleaners—Welded Pressure Vessels—Refinery Equipment, etc.

DONOVAN
Oil Country Boilers and Tanks. Boilers range from low pressure to 350 pounds, W.P., for the deepest drilling demands.

JONES & LAUGHLIN
Tubular Goods—Buttwelded, Lapwelded and Seamless in Line Pipe, Casing, Drill Pipe and Tubing.

PIPE FABRICATING
We are equipped to quickly handle pipe fabrications and installations to your specifications.

RATIGAN
"SURE-GRIP" line of pumping equipment, including Grips, Clamps, Beam Hangers, Rod Elevators, etc.

REID
Gas Engines, two and four-cycle; Diesel Engines; Band Wheel and Direct Drive Pumping Powers; Receiving Boxes and other refinery equipment.

ROEBLING
Wire Line; Gas and Electric Welding Wire.

ROSSENDALE
"Camel Hair" and Stitched Canvas Belting.

WALWORTH
Fittings, Valves and Tools for Oil, Gas, Air, Water and Steam; Sigma Steel Drilling Gate Valves; Flow Line and Refinery Valves.

WHITLOCK
Manila Cordage, Drilling Cables, Bull Ropes, Cat Lines, etc. Either Waterflex or Plain.

FRICK-REID
SUPPLY CORPORATION

PITTSBURGH, PENNA. TULSA, OKLA.

and BRANCHES

Completions in East Texas Field 110, One Dry; Locations During Week Numbered 116

By L. E. BREDBERG

DALLAS, Tex., Oct. 3.—Two years ago today C. M. (Dad) Joiner was rewarded for his long effort in seeking oil in the sand hills of southern Rusk County, when his third trial on the Daisy Bradford farm in the Juan Ximinez Survey, showed for a small producer. Hundreds of oil men, farmers and business men had gathered around the old wooden derrick to observe the crew making final trials for production. Many company men and others were dubious about its making a commercial producer, regarding it as only a freak which would not amount to much.

Since that time around 8,400 producing wells have been drilled in the field, 140 of which are making various percentages of salt water, while there are around 160 on the pump. There have been more wells in the field making water, but many of them have been plugged back to shut off the water and produce free oil. Some were abandoned when this reworking failed to accomplish its purpose.

The field has been defined on all sides by salt water wells and dry holes. On the southern end an area of dry gas was encountered and so far there have been seven gas wells drilled and put on production in this area, southern Rusk County. The northern producing area extends over into Upshur County, and the southwestern corner of the field over into Cherokee County. Smith, Gregg and Rusk are the other three counties in which the field lies, the main part of the field being located in western Rusk and Gregg Counties.

Proration Record

Different forms of proration were tried in the field without avail until Governor Sterling shut in the field with national guard troops and a military order on August 17, 1931, lifting that order on September 5 of the same year and allowing the operators and companies to produce only 225 bbls. per well. There were 1,817 wells producing when that allowable was granted. Since that time there have been 19 changes in the per well allowable, ordered by the Railroad Commission. These changes are as follows:

	Allowable (bbls.)	No. of wells producing at that time
1931—		
September 5	225	1,817
September 21	185	2,050
October 13	165	2,344
October 29	150	2,666
November 7	125	2,836
December 11	100	3,387
1932—		
February 5	75	4,015
March 16	72	4,565
April 1	71	4,714
April 16	67	4,957
May 1	61	5,250
May 16	59	5,500
June 1	54	5,800
June 16	51	6,244
July 1	50	6,500
July 19	46	6,800
August 1	44	7,125
August 16	43	7,470
September 1	50	7,740
September 16	46	8,000
October 1	44	8,400

Notice on September 1, 1932, the allowable was raised from 43 to 50 bbls. per well by the Railroad Commission. As a result of much criticism and petitions signed by many operators, the allowable was cut back to 46 bbls. on September 16, and again on October 1, to 44 bbls. This latter allowance will be in effect until October 16 when it will no doubt be cut to a still lower figure.

Price Movement

Prices in the field dropped to as low as 10 cents in August and September, 1931, when the field was allowed to flow wide open, producing over 1,000,000 bbls. per day the last two days before the military shutdown. After the shutdown the price began to pick up, until it was increased to 98 cents per barrel by the Magnolia Petroleum Co., at which level it has remained for months. Just recently the market has weakened, almost to the breaking point, but with cutting the allowable to market demand, or from the present 375,000-bbl. daily allowable of the field back to the old allowable of 325,000 bbls., and with commission forces working to stop illegal production, and public sentiment strongly against such a cut in price, it is hoped that a decrease has been prevented, at least for the present.

There are over 113,900 producing acres in the field, and approximately 14.4 wells per acre, independent operators having drilled their properties more densely than the major producers. Majors own 79,955 acres and independents 33,950 acres.

There are 17 major pipe lines leading from the field, the majority to the Gulf Coast. There are 25 refineries in the field, with two more under construction. The majority are operating. But few of the many early constructed loading racks are in use, pipe lines transporting most of the oil. Capacity of pipe lines is approximately 800,000 bbls. per day, and of local refineries 75,000 bbls.

There are in the neighborhood of 470 drilling wells in the field at present, the peak having been reached in March and April when there were around 800 going down, drilling having gradually decreased since that time as the independents drilled up their properties.

The 16 leading producers in the field are: Humble Oil & Refining Co., Gulf Production Co. and others, Sinclair Prairie Oil Co., Magnolia Petroleum Co., Atlantic Oil Producing Co., Sun Oil Co., Shell Petroleum Corp. and others, Stanolind Oil & Gas Co. and others, Tidal Oil Co., Mid-Kansas Oil & Gas Co., Arkansas Fuel Oil Co., Yount Lee and others, East Texas Refining Co., H. L. Hunt, Inc., Empire Gas & Fuel Co., and The Texas Company.

Unparalleled Troubles

The East Texas Field has been unparalleled in regard to troubles encountered in curtailing production, the theft of oil, legal battles brought by operators and state officials alike, and many other chaotic conditions which have run rife during the field's short hectic career. One decision remains to be handed down by a three-judge Federal court which recently adjourned in Houston. This case was brought by two operators who attacked proration in the field, seeking a permanent injunction against the Railroad Commission to prevent that body from restraining the two operators from producing their wells as they desired. Other operators seeking the same form of restraining order consolidated their cases with the first two. The decision is expected to be rendered within another week or two, and will either uphold the commission and strengthen proration and the commission's authority, or will cause much more trouble for those trying to curtail production in the State.

An oil theft investigation committee has been organized by the commission, with headquarters at Tyler, and consists of about 40 men who are checking runs through pipe lines, to refineries, and loading racks, and also truck shipments from the fields. Two men have been convicted for oil theft in the field, and several more are under indictment for the same offense. It is hoped this committee will put a stop to stolen oil, and check at least 25,000 bls. per day illegal production, which should help strengthen the market.

The total recovery in the East Texas Field can only be estimated due to the large amount of oil produced and not reported during June, July and August of 1931 when the field was producing wide open, and also because of much oil being "by-passed" and stolen in the field during the past few months. Total recovery figures worked up by company scouts, up to September 30, this year, place the amount at nearly 198,000,000 bbls. How mnay more million barrels have been produced and unaccounted for can only be given a wild guess.

It will be interesting to note just what two more years of production and further drilling will do to the field, how pressures subside, and how salt water encroaches from the west side. Many are of the opinion the field will flow for only another year, even under present curtailed allowables; others estimate it will flow for two, three and even five years. Geologists and engineers disagree on these estimates, consequently one person's guess is about as good as another.

Little Oil in Storage

The field is approximately 40 miles in length, including the gas producing area and three extreme northern producers which are located in Upshur County. At the widest point it is nearly 9 miles across. This is in the northern Gregg County area. The field narrows at Kilgore to around 3 miles in width and widens out again in the Joiner area, Rusk County.

There is but little oil in storage in East Texas, and since the announcement by Ernest O. Thompson, member of the Railroad Commission, that he was in favor of preventing stocks piling up above ground, thereby causing physical waste of the high gravity oil, the meeting to be held at Austin on October 8 will no doubt take considerable time in going into this matter, and it is expected that some revolutionary change may be made to prevent further storage of millions of barrels of oil. If some such change can be effected it may put an entirely different aspect on the situation, which may in turn maintain a future steady market, and simplify proration in this and various other fields. The state legislature may even be asked to frame a bill preventing the accumulation of vast stocks of stored oil in the future. Regulation of production would prevent such accumulations. Prevention of running millions of barrels of oil to storage would also have a tendency to uphold price, according to many producers, for if some of the major purchasers who have such empty storage could not fill it with oil after the price was decreased to the point where they would care to purchase large quantities to run to their tanks, they would not be so hasty in posting lower prices.

New Locations

There were 116 locations staked in the East Texas district this week, two of which were for wildcat tests, and the others in the field. There were 110 completions, one of which was a dry hole on the extreme southern end. There were three dry holes abandoned in wildcat areas. Frazier and others abandoned their No. 1 H. L. Hudson in Anderson County at a total depth of 5,124 feet. It topped the Pecan Gap chalk at 2,927 feet, went out of it at 3,020 feet, topped the Austin chalk at 4,029 feet and went out of it at 4,472 feet.

C. W. Murchison and others' No. 1 S. G. Denton in the E. B. Reynolds Survey, Henderson County, was abandoned at a total depth of 4,895 feet. It topped the Pecan Gap chalk at 2,749 feet, and the Austin at 3,605 feet, going out of the latter at 3,977 feet.

C. Hauseman's No. 1 J. F. Griffith in the Samuel Waddell Survey, Hill County, marked another area off as it was abandoned at 3,080 feet.

Pure Oil Co.'s No. 1 W. B. Nicholson, in the Stewart Survey, Cherokee County, does not look very promising after topping the Austin chalk at 3,030 feet. Surface elevation is 455 feet, which puts top of the chalk stratum at minus 3,575 feet, believed to be low. Top of the Pecan Gap chalk was logged at 3,170 feet. The test is drilling below 4,080 feet.

Leon County's interesting wildcat of the Shell Petroleum Corp., Penn Oil Co. and others in the A. Swayze Survey, is drilling near 5,000 feet. Austin chalk was topped at 4,851 feet in this test. Elevation is 423 feet.

Harris and others' No. 1 Markowitz, about 2 miles south of Emory, in the Charles Velpoler Survey, Rains County, topped the Austin chalk at 3,518 feet and is drilling below 3,565 feet.

Burnham and others' No. 1 Weiss in the Jessie Dean Survey, Bowie County, topped gray sand at 3,854 feet and white sand at 3,862 feet, showing salt water with a showing of oil when drill stem test was made from 3,756-64 feet. It is coring at 3,865 feet. Elevation is 388 feet.

Fred Prince and others have made location on the Mattie E. Ferguson farm, Rogers Survey, for their No. 1 test in Franklin County.

Fred Shields and the Florence Oil Co. have made location for a Woodbine sand test on the R. L. Buckner farm in the John C. Davis Survey, Rusk County.

Paul Meadors of Tyler is to drill a test on a 6,500-acre block in Kaufman County, which was assembled by W. N. Stuart and R. K. Crow of Wills Point. The block is in the Juan Escular, L. Gonzales, W. H. McBee, W. Gribbard and Sullivan, and southern part of the N. E. Walling Survey near Bobbs Switch and old townsite of Cedar Grove.

Cartwright Brothers of Terrell have turned a 6,000-acre block to Tom Nash of Dallas and a test will be started on the block at once. Location will be made in the M. Galbreath Survey. The center of the block is approximately in the east corner of the latter survey.

Wood County Tests

A test is to be drilled in the Candler Survey on a 30,000-acre block in Wood County, and another test may be drilled by Hudson and Shelton south and east of their Talco test on 7,000-acre block.

F. A. Fuller of Shreveport, La., has assembled a 5,000-acre block in Bowie County, centering in the William Young, D. Hardy and John Hardy Surveys, south and east of the town of Avery. A test will be drilled on the block.

Burnham and Pat Marr and others continue to buy acreage north and northwest of No. 1 Weiss in Bowie County and will carry their test to the Trinity sand.

George Beasley of Fort Worth has assembled a block of acreage centering in the southwest corner of the Raphael De La Pena League grant, 4 miles north-

east of Ennis and has taken approximately 1,500 acres in the J. A. Steadman, R. R. Looney, J. Harris, W. A. Park, G. Kirk, A. Howell, J. A. Lane, J. W. Brook, G. G. Alford, William B. Harris and Pena Surveys, and will drill a Woodbine sand test.

Mr. Sellman of Gladewater has assembled approximately 2,300 acres centering in the F. McHenry and H. B. Dickerson Surveys, approximately 2 miles southwest of Silver Lake in Van Zandt County and will drill a test if he can get 4,000 acres in the block.

With a statewide proration hearing pending for October 8 at which time it is expected the East Texas Field will again be cut back to a maximum daily allowable of 325,000 bbls. with oil theft being checked by the Railroad Commission special investigation committee headed by Homer Pierson, other companies not following the Humble Oil & Refining Co. in reducing their purchases as it has, to 60 per cent of the daily per well allowable, and with public sentiment arrayed against a price cut, it is generally believed that company will terminate its present takings and revert to 100 per cent takings in the field.

The situation in East Texas looks considerably better than it did last week or two weeks ago at this time. A spirit of optimism is now gaining ground, whereas before the operators felt that the pending price cut would come at any time thereby making it more difficult for them to meet their obligations and realize any profits from their wells. They are, at least 99 per cent, for further curtailment in production if it will only stave off a price cut. They are more than willing to co-operate in cutting production if given credit by the price being held at its present level.

COMPLETIONS IN EAST TEXAS

Cherokee County

Mid-Kansas Oil & Gas Co.'s No. 6 H. D. Kelley, top sand 3,686 feet, initial production 82 bbls. per hour on 2-inch lead, total depth 3,688 feet.

North Gregg County

Atlantic Oil Production Co.'s No. 7 McBee-Fisher, top sand 3,471 feet, initial production 64 bbls. per hour through tapered tubing, total depth 3,516 feet; No. 26 J. M. Moore, top sand 3,500 feet, initial production 64 bbls. per hour through tapered tubing, total depth 3,527 feet; No. 27 J. M. Moore, top sand 3,492 feet, initial production 64 bbls. per hour through tapered tubing, total depth 3,522 feet; No. 12 Turner, top sand 3,572 feet, initial production 64 bbls. per hour through tapered tubing, total depth 3,621 feet. Atlantic and Stanolind Oil & Gas Co.'s No. 6 S. C. Fishburn, top sand 3,503 feet, initial production 64 bbls. per hour through tapered tubing, total depth 3,528 feet. Brown Eagle Oil Co.'s No. 4 T.&P.R.R., top sand 3,595 feet, initial production 37 bbls. in one-quarter hour through 1-inch tubing choke, total depth 3,625 feet.

Columbia Oil & Gas Co.'s No. 4 A. Christian, top sand 3,564 feet, initial production 20 bbls. in one-half hour through tapered tubing, total depth 3,595 feet; No. 6-A Doby, top sand 3,576 feet, initial production 65 bbls. per hour through tapered tubing, total depth 3,594 feet. East Texas Refining Co.'s No. 5 W. J. and G. Hindman, top sand 3,631 feet, initial production 46 bbls. in 45 minutes through tapered tubing, total depth 3,660 feet. Humble Oil & Refining Co.'s No. 4 L. Christian, top sand 3,629 feet, initial production 93 bbls. per hour through three-quarter inch tubing choke, total depth 3,674 feet; No. 6 M. Wells, top sand 3,674 feet, initial production 82 bbls. per hour through three-quarter inch tubing choke, total depth 3,695 feet. Rose V. Glasscock's No. 1 T. B. Harris, top sand 3,480 feet, initial production 40 bbls. in one-quarter hour through 1-inch tubing choke, total depth 3,492 feet.

J. E. Mabee's No. 2 Whitehurst, top sand 3,635 feet, initial production 60 bbls. per hour through three-quarter inch tubing choke, total depth 3,641 feet. Magnolia Petroleum Co.'s No. 6 Todd-Stinchcomb, top sand 3,549 feet, initial production 110 bbls. per hour through 2-inch open tubing, total depth 3,555 feet; No. 7 Todd-Stinchcomb, top sand 3,507 feet, initial production 104 bbls. per hour through open 2-inch tubing, total depth 3,527 feet. Marine Production Co.'s No. 4 York, top sand 3,572 feet, initial production 75 bbls. per hour through 1-inch open tubing, total depth 3,612 feet. Reddick & Hugus' No. 2 S. C. Smith, top sand 3,529 feet, initial production 72 bbls. in one-half hour through 2-inch open tubing, total depth 3,572 feet. Sun Oil Co.'s No. 4 J. N. Campbell, top sand 3,473 feet, initial production 107 bbls. per hour through open 2-inch tubing, total depth 3,555 feet; No. 6 J. N. Campbell, top sand 3,476 feet, initial production 50 bbls. per hour through tapered tubing, total depth 3,522 feet. The Texas Company's No. 5 Clark, top sand 3,580 feet, initial production 91 bbls. per hour through 1-inch tubing choke, total depth 3,624 feet. Tidal Oil Co.'s No. 17 Lake Devernia, top sand 3,490 feet, initial production 21 bbls. in 10 minutes through open 2-inch tubing, total depth 3,530 feet. Wise & Jackson's No. 4 R. Corbin, top sand 3,605 feet, initial production 75 bbls. per hour through 1-inch tubing choke, total depth 3,645 feet.

Yount Lee Oil Co.'s No. 3-B I. Denson, top sand 3,658 feet, initial production 68 bbls. per hour through elevensixteenths inch tubing choke, total depth 3,678 feet; No. 1 T. W. Lee, top sand 3,565 feet, initial production 63 bls. per hour through eleven-sixteenths inch tubing choke, total depth 3,577 feet; No. 4-B S. G. Smith, top sand 3,515 feet, initial production 74 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,535 feet; No. 5-C M. Smith, top sand 3,514 feet, initial production 75 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,534 feet.

South Gregg County

F. A. Bates' No. 4 M. T. Cole, top sand 3,568 feet, initial production 50 bbls. per hour through open tubing, total depth 3,577 feet. Blue Star Oil Co.'s No. 6-B Sabine River, top sand 3,547 feet, initial production 78 bbls. per hour through three-quarters inch tubing choke, total depth 3,559 feet. Champlin and Bass' No. 4 Watson, top sand 3,588 feet, initial production 75 bbls. per hour through three-quarters inch tubing choke, total depth 3,610 feet. F. E. Flannery and others' No. 1 M. T. Cole, top sand 3,524 feet, initial production 75 bbls. per hour through three-quarters inch tubing choke, total depth 3,568 feet. Gulf Production Co.'s No. 43 Hilburn, top sand 3,534 feet, initial production 83 bbls. per hour through three-quarters inch tubing choke, total depth 3,549 feet. Island Oil Co.'s No. 1 M. J. Register, top sand 3,631 feet, initial production 75 bbls. per hour through three-quarters inch tubing choke, total depth 3,641 feet.

M. Spalding's No. 1 W. P. Crews, top sand 3,727 feet, initial production 85 bbls. per hour through open tubing, total depth 3,730 feet. Lion Oil & Refining Co.'s No. 4 A. A. King, top sand 3,547 feet, initial production 65 bbls. per hour through open tubing, total depth 3,630 feet. C. H. Lyons' No. 2 F. J. Richards, location abandoned. M. W. McVey's No. 1 Roy Laird, top sand 3,533 feet, initial production 50 bbls. per hour through open tubing, total depth 3,585 feet. Mead Oil Co.'s No. 3 I.&G.N.R.R., top sand 3,559 feet, initial production 50 bbls. per hour through three-quarters inch tubing choke, total depth 3,589 feet. Producers Investment Co.'s No. 3 W. N. Crim, top sand 3,540 feet, initial production 75 bbls. per hour through 2½-inch tubing, total depth 3,601 feet. E. J. Raddatz' No. 2 Sabine River, Tract No. 8, top sand 3,430 feet, initial production 30 bbls. in 15 minutes through 1-inch tubing choke, total depth 3,458 feet. H. R. Smith's No. 4 B. Grey, top sand 3,664 feet, initial production 75 bbls. per hour through three-quarters inch tubing choke, total depth 3,670 feet. Heyser and Heard's No. 1 M. Strong, top sand 3,686 feet, initial production 8 bbls. per hour through one-half inch tubing choke, by heads, total depth 3,687 feet.

Stewart and Duffy's No. 1 R. M. Spear, location abandoned. Sun Oil Co.'s No. 13 M. T. Cole, top sand 3,524 feet, initial production 50 bbls. per hour through tapered tubing, total depth 3,562 feet; No. 3 Joe Rollins, top sand 3,593 feet, initial production 51 bbls. per hour through tapered tubing, total depth 3,640 feet. The Texas Company's No. 8 H. T. Elder, top sand 3,630 feet, initial production 85 bbls. per hour through open tubing, total depth 3,650 feet. Tidal Oil Co.'s No. 11 Bivens, top sand 3,638 feet, initial production 10 bbls. in 5 minutes through open tubing, total depth 3,645 feet; No. 10 J. S. King, top sand 3,552 feet, initial production 21 bbls. in 10 minutes through open tubing, total depth 3,586 feet.

North Rusk County

East Texas Refining Co.'s No. 9 D. Wills, top sand 3,582 feet, initial production 43 bbls. per hour through tapered tubing, total depth 3,587 feet; No. 2 L. Morse, top sand 3,598 feet, initial production 80 bbls. in 30 minutes through open tubing, total depth 3,662 feet. Gulf Production Co.'s No. 5 Sexton estate, top sand 3,631 feet, initial production 30 bbls. per hour through three-quarters inch tubing choke, total depth 3,708 feet; No. 4 M. R. Terrell, top sand 3,611 feet, initial production 42 bbls. per hour through three-quarters inch tubing choke, total depth 3,617 feet.

Humble Oil & Refining Co.'s No. 60 L. D. Crim, top sand 3,582 feet, initial production 90 bbls. per hour through three-quarters inch tubing choke, total depth 3,626 feet; No. 61 L. D. Crim, top sand 3,583 feet, initial production 90 bbls. per hour through three-quarters inch tubing choke, total depth 3,628 feet; No. 17-B S. S. Laird, top sand 3,500 feet, initial production 24 bbls. per hour through open tubing, total depth 3,563 feet; No. 4 J. Wooley, top sand 3,658 feet, initial production 75 bbls. per hour through three-quarters inch tubing choke, total depth 3,745 feet. Lewis Production Co. and Selby Oil & Gas Co.'s No. 6 L. C. Pegues, top sand 3,570 feet, initial production 40 bbls. in 15 minutes through 2-inch open tubing, total depth 3,613 feet.

Ruebin & Nadel's No. 2 D. Wills, top sand 3,642 feet, initial production 72 bbls. in one-half hour through open casing on 2-inch lead, total depth 3,647 feet. Smith & Gohlson's No. 2 Terrell, top sand 3,640 feet, initial production 30 bbls. in one-half hour through open tubing, total depth 3,664 feet, tested salt water at 3,664 feet and was plugged back to 3,642 feet. Clint Wood Drilling Co.'s No. 1 Scroggins, top sand 3,675 feet, initial production 45 bbls. in one-half hour through three-quarter inch tubing choke, total depth 3,680 feet.

South Gregg County

Beard & Hammond's No. 3 W. P. Keeling, top sand 3,682 feet, initial production 40 bbls. in 25 minutes through open 2-inch tubing, total depth 3,712 feet. C.&P. Oil Co.'s No. 5 Giles, top sand 3,724 feet, initial production 120 bbls. in 1 hour and 20 minutes through 2½-inch open tubing, total depth 3,758 feet. Demonstrand Oil Corp.'s No. 4 L. J. Pinkston, top sand 3,600 feet, initial production 30 bbls. in one-half hour through open 2½-inch tubing, total depth 3,632 feet. F.H.E. Oil Corp. and others' No. 2-D Thompson, top sand 3,729 feet, initial production 46 bbls. in one-half hour through 2½-inch open tubing, total depth 3,779 feet. Golding & Murchinson's No. 21 Ida L. Kinney, top sand 3,556 feet, initial production 65 bbls. per hour through open 2½-inch tubing, total depth 3,636 feet; No. 2-B Strickland, top sand 3,585 feet, initial production 30 bbls. per hour through open 2½-inch tubing, total depth 3,677 feet. Haynes Drilling Co.'s No. 6 Brown, top sand 3,671 feet, initial production 61 bbls. per hour through open 2½-inch tubing, total depth 3,710 feet.

Humble Oil & Refining Co.'s No. 3 J. E. Arnold, top sand 3,664 feet, initial production 32 bbls. per hour through three-quarter inch tubing choke, total depth 3,744 feet; No. 3 B. J. Bagwell, top sand 3,682 feet, initial production 16 bbls. in one-half hour through three-quarter inch tubing choke, total depth 3,683 feet; No. 8 J. R. Box, top sand 3,756 feet, initial production 19 bbls. in 15 minutes through three-quarter inch tubing choke, total depth 3,801 feet; No. 23 W. L. Price, top sand 3,726 feet, initial production 15 bbls. in one-quarter hour through three-quarter inch tubing choke, total depth 3,790 feet; No. 10-A R. E. L. Silvey, top sand 3,660 feet, initial production 60 bbls. per hour through three-quarter inch tubing choke, total depth 3,748 feet; No. 11 J. E. Wheelis, top sand 3,769 feet, initial production 36 bbls. in one-half hour through

(Continued on Page 68)

East Central Texas Wildcats

Week Ending October 3

ANDERSON COUNTY

Company, well, farm name, section and block—	Remarks:
Frazier et al's No. 1 H. L. Hudson, 200 ft. from S line and 200 ft. from W line of 196-ac. tract, M. Rionda Sur.	S.D. 5,006 ft.
Roeser and Pendleton's No. 1 M. A. Davy, 660 ft. from N line and center of E and W lines of tract and survey, P. G. Adams Sur.	Moved location.
C. R. Wilmuth et al's No. 1 N. B. Watson, 500 ft. from W line and 4,850 ft. from N of S line of survey in S½ of 129-ac. tract, M. Main Sur.	T.D. 1,538 ft.

ANGELINA COUNTY

W. J. Chandler's No. 1 L. J. Dearman, 350 ft. from S and W lines of 20-ac. tract, J. T. Peavy Sur.	Waiting on cmt. to set.
Huriburt et al's No. 1 Long Bell Lumber Co., 160 ft. N and 200 ft. W of SE cor. of survey, H.T.&B. Sur.	Drlg. 2,320 ft.

BOWIE COUNTY

Roy Anderson's No. 1 Dykes, 2 miles W of Texarkana, M. Dykes Sur.	Coring 2,638 ft.; top Austin chalk 2,320 ft.
Burnham-Robertson and Greer's No. 1 F. O. Weiss, 850 ft. from N line and 200 ft. from W line of B. H. Williams 50-ac. tract, Jessie Dean Sur.	Coring 3,862 ft.

CHEROKEE COUNTY

Barkley Tate et al's No. 1 H. E. Neal, 330 ft. from N and W lines of tract, J. M. Prosella Sur.	Derrick.
Bridges and Candler's No. 1 Berryman, center of Derryman tract, H. Kimble Sur.	S.D. 1,000 ft.
Davis et al's No. 2 Annie Kelly, 631 ft. W of No. 1, M. De Los Santos Coy Sur.	Derrick.
Mid-Kansas Oil & Gas Co.'s No. 5 H. D. Kelley, 330 ft. from N line and 1,982 ft. from E line of lease, M. D. L. S. Coy Sur.	Drlg. 1,350 ft.
Mid-Kansas Oil & Gas Co.'s No. 7 H. D. Kelley, 330 ft. from N and W lines of lease, M. D. L. S. Coy Sur.	Derrick.
Pure Oil Co.'s No. 1 W. B. Nicholson, 300 ft. from S and E lines of 72-ac. tract, R. Stewart Sur.	S.D. 3,620 ft.
Wilson & Stubbs' No. 1 L. Robert, 450 ft. from S and 150 ft. from W line of lease, J. B. Wolfin Sur.	S.D. 3,600 ft.

DELTA COUNTY

Commerce Oil Co.'s No. 1 Ablowich, 150 ft. from S line and 776 ft. from W line of H. D. Jewett 52-ac. tract, E. Chick Sur.	S.D. 3,813 ft.
Joiner et al's No. 1 Blackwell, 300 ft. S and 150 ft. from E lines of 275-ac. tract, Dunnetelle Sur.	S.D. 3,310 ft.

ELLIS COUNTY

Armstrong's No. 1 Milton Cook, SE cor. of 50-ac. tract, S. Frederick Sur.	S.D. 375 ft. (corrected).
Armstrong Bros.' No. 1 Reeves	Waiting on cmt. to set 100 ft.

(Continued on Page 69)

No Further Showings Yet in Coke County Test; North Texas and Panhandle Developments

By L. E. BREDBERG
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Oct. 3.—The Coke County wildcat of the Mid-Kansas Oil & Gas Co. on the Henry farm in Section 271, Block 1-A, H.&T.C. Survey, is drilling slowly, encountering no further showings of oil. It swabbed around 20 bbls. on September 28, which was 15 hours' accumulation, and on the day before that swabbed 30 bbls., a 10 days' accumulation. Gravity is 40.5 degrees. It is drilling below 3,966 feet, and will drill until it strikes an increase in oil or encounters water. The oil showing was logged from 3,940-42 feet. Six-inch casing was underreamed last week from 3,760 feet to 3,782 feet to shut off salt water struck at 3,834 feet. This is the second test in this area to have encountered a good showing of oil, the same company having drilled the former test nearby.

Fisher County

Fisher County's deep test of Cranfill & Reynolds on the George farm, Section 200, Block 1, B.B.B.&C. Survey, is drilling around 6,245 feet with an increase in salt water logged at 6,224-26 feet, water steadily rising in the hole, slowing up drilling and making the test look more unfavorable as a possible deep producer.

Irion County

Plymouth Oil Co. and others' No. 1 Suggs, in Section 3,081, Block 28, H.& T.C. Survey, deep wildcat test in Irion County, is preparing to abandon with total depth at 8,280 feet. Water was logged at 8,274 feet, increasing to four bailers per hour from 8,278-80 feet. The test formerly encountered oil showings at 3,218-27 feet, and 6,920 feet, striking a showing of gas at 6,820 feet. Elevation is 2,355 feet. This leaves one other deep wildcat on the drilling report, although that test has been shut down at 6,519 feet for some time. It is being drilled by the Stanolind Oil & Gas Co., and may also be given up as a failure. Both tests were drilled in an effort to pick up the Ordovician lime pay from which 10 deep wells in the Big Lake Field, Reagan County, adjacent county to the west, are producing.

Ector County

Broderick & Calvert's interesting wildcat on the Parker ranch, Section 15, Block 44, Township 2s, T.&P. Survey, Ector County, was drilling at 4,245 feet today with no further showings or increase in oil. It had a scum of oil from 4,177-80 feet and another small showing from 4,185-92 feet which focused attention on the test this week.

Crockett County

Stanolind Oil & Gas Co.'s No. 1 J. S. Todd, north central Crockett County Ordovician test, is drilling near 5,200 feet. It is in Section 67, Block UV, G.C.&S.F. survey, on a unitized block held by several major producing companies.

Glasscock County

Noel T. Lawson of San Angelo is blocking acreage centering around Section 21, Block 34, Township 2s, T.&P. Survey, northwestern Glasscock County, for an 8,000-foot test which will be drilled in an effort to pick up the Ordovician pay found in the Big Lake Field, Reagan County.

Pecos County

Arthur Adams and others' No. 1 Shearer, in the Masterson-Shearer Pool, Pecos County, is spraying an estimated 25 bbls. of oil with around 1,000,000 feet of gas presaging a small producer for the test, which is the first to be drilled in this pool for over two years. It is now shut down at 1,417 feet connecting up to storage. An increase in oil was struck from 1,405-17 feet. It is in Section 101, Block 10, H.&T.C. Survey, almost a quarter of a mile northeast of the discovery well of the area, which was drilled by Cranfill & Reynolds and Monte Warner.

Reagan County

Jim Woods of San Angelo has made a deal with the Atlantic Production Co. for a half interest in approximately 6,700 acres lying mostly in Block 1, T.&P. Survey, 2 miles north and east of the town of Big Lake, Reagan County, and will probably drill a 3,000-foot test.

Ward County

Hults & Weekley's No. 1 Burke, in Section 26, Block B-29, Public School Lands Survey, Ward County, is still shut down at 2,200 feet gassing at an estimated rate of 20,000,000 feet per day from 2,165-70 feet.

Total potential of the Howard-Glasscock County area is placed at 77,211 bbls. daily with a daily outlet of 15,000 bbls. There are 531 producers in the field owned by 65 operators.

Potential of the Yates Field, Pecos County, is placed at 2,321,662 bbls. based on a 12-hour gauge. Daily allowable is 65,000 bbls.

Potentials of the Crane-Upton County fields are placed at 56,067 bbls., with a daily allowable of 13,259 bbls. There are 597 producing wells in these fields.

WICHITA FALLS DISTRICT

The recent strike of the Helena Oil & Gas Co. on the Ray ranch 1 mile northeast of Archer City, northeast Archer County, has pumped 50 bbls. of oil in three hours from sand topped at 1,134-37 feet. The oil is being sold to the Taxman Refining Co. at Wichita Falls. Wayne King and others' No. 1 King, a south offset, was a disappointment, proving dry at 1,154 feet, partially restricting the newly opened area.

The Panhandle Refining Co. of Wichita Falls has announced that effective October 1, at 7 a. m., it would pay 90 cents per barrel for all crude oil purchased by it and delivered by the producer at the plant in Wichita Falls. Pipe line charges are to be deducted from the 90-cent a barrel payment, which will being the top price to producer of 72½ cents a barrel.

The Olney Refining Co. of Olney, Tex., has announced that it would purchase 60 per cent of the crude oil it runs, and store the remaining 40 per cent, charging nothing for the storage. The Wagoner Refining Co., Electra, offers to purchase 60 per cent of its runs and store 40 per cent, charging producers at the rate of 2 cents per barrel per month for storage. The Taxman Refining Co. of Wichita Falls is reported to have purchased under contract 100,000 bbls. of crude in the Panhandle Field to be delivered at its refinery at the posted price for oil of the grade delivered, less the cost of transportation, which is said to be about 12 cents per barrel.

The Tedford Pool in southeast Archer County has apparently been defined. It is producing 612 bbls. from 28 wells, and the Olney Refining Co. at Olney is getting the oil which is being transported by the Sinclair Prairie Pipe Line Co. Part of the pool is making considerable water. Production is coming from around 700 feet in this recently opened area.

The property acquired by the Phillips Petroleum Co. from the Shell Petroleum Corp. in Wilbarger County include Shell's W. T. Waggoner "A" lease in the NW NE, Section 43, Block 4, H.&T.C. Survey, including three producing wells which are making 25 bbls. daily. Five wells have been abandoned on this lease. It also acquired the Waggoner "D" lease which is the SW SW, Section 42, Block 4, H.&T.C. Survey, including four wells which are making 25 bbls. daily.

The Phillips Petroleum Co. also traded some Kansas production to the Derby Oil Co. for the latter's 40-acre lease in Section 40, M.E.P.&P. Survey and in the J. D. Purnell Survey, known as the Derby "A" lease. It is now known as the "Staley" Waggoner lease, and has four producers making 3 bbls. daily. Phillips Petroleum Co. also acquired the Derby "C" lease, which is the NE SE, Section 43, M.E.P.&P. Survey, including two wells which are making 40 bbls. daily. It is now known as the "Howell" Waggoner lease.

Panhandle District

Reiger of Reiger and Stekoll may drill a test in the W half, Section 85, Block 7, I.&G.N. Survey, some distance from the main part of the field in Carson County, making an interesting test. Reiger and Stekoll's No. 1 Martin in Section 90, in this area was completed for 20,000,000 feet of gas in 1930 and sprayed oil, but the oil was exhausted. However, it is leading the owners to drill the second test in the vicinity which may pick up more oil production.

Cochran Brothers have an 11,480-acre block in southwest Collingsworth County, and will drill a test in the NE cor., Section 26, Block 21, 6 miles south and 3 miles east of the present A. T. Kates' No. 1 Bell test. The block is located in Blocks 14, 15 and 21, H.&G.N. Survey.

Humble Pipe Line Co.'s new order which curtailed its takings to 60 per cent of the allowable in the Panhandle Field was felt in force this week, cutting the daily average of the field about 2,590 bbls. The company is expected to revert soon to its old and other purchasers' policy of taking the full 100 per cent of the allowable.

Wildcat Operations in West Texas

Week Ending October 3

Company, well, farm name, section and block—	Remarks—
BORDEN COUNTY	
Westyde Investment Co.'s No. 1 Looney, 990 ft. from S and E, Sec. 15, Blk. 31, Twp. 4n. T.&P. Sur.	T.D. 855 ft.; driving 10-in. csg.
BREWSTER COUNTY	
Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor., Sec. 45, Blk. G-15, G.C.&S.F. Sur.	S.D. 1,935 ft.
E. L. Chapman's No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur.	S.D. 1,302 ft.
Joiner's No. 1 McIntire, 853 ft. from S and 2,390 ft. from E, Sec. 31, Blk. 352, W. J. Mitchell Sur.	S.D. 240 ft.
Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 930 ft. from N and 2,500 ft. from E of Sec. 18, Blk. G-15, G.C.& S.F. Sur.	S.D. 2,900 ft
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 252, 7 miles south Alpine	S.D. 1,750 ft.
CONCHO COUNTY	
Beesley et al's No. 1 Waring Estate, 400 ft. from N and E, Sec. 163, T.&N.O. Sur.	S.D. 2,135 ft.
Simmons et al's No. 1 Schultz, 150 ft. from W and center N and S of E half of J. Weber Sur., Abst. 154.	S.D. 975 ft.
CROCKETT COUNTY	
Doleman & Moore's No. 1 Ferner, 2,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur.	Spudded and S.D.
Stanolind Oil & Gas Co. et al's No. 1 Todd, 1,370 ft. from N and 1,320 ft. from E, Sec. 67, Blk. UV, G.C.&S.F. Sur.	Drlg. 5,175 ft.
The Texas Company's No. 1 B. B. Ingham, 330 ft. from S and 2,330 ft. from E line, Sec. 36½, I.&G.N. Sur.	Drlg. 1,930 ft.
J. D. Young Co.'s No. 1 Shannon, 330 ft. from N and W, Sec. 35, Blk. 1, G.C.&S.F. Sur.	Spudded and S.D.
COKE COUNTY	
Mid-Kansas Oil & Gas Co.'s No. 1 Hearn, 980 ft. from S and W, Sec. 271, Blk. 1-A, H.&T.C. Sur.	T.D. 3,947 ft.; show oil 3,945 ft.; to deepen.
CULBERSON COUNTY	
Milton-Dorsey's No. 1 Biggs, 4,181 ft. from N and 150 ft. from E, Sec. 2, Blk. 112, P.S.L. Sur.	Location.
DAWSON COUNTY	
Albaugh et al's No. 1 Robinson, C NW Sec. 46, Blk. M, E.L.&R.R. Sur.	Shut down.
ECTOR COUNTY	
Broderick & Calvert's No. 1 Parker, 330 ft. from N and W, Sec. 15, Blk. 44, Twp. 2s, T.&P. Sur.	Show oil 4,178 and 4,185 ft.; drlg. 4,245 ft.
Duffey et al's No. 1 Rutledge, 990 ft. from S, 330 ft. from E, Sec. 7, Blk. B-15	Rigging up.
L. C. Harrison et al's No. 1 Addis, 330 ft. from N and 1,320 ft. from W, Sec. 35, Blk 49, Twp. 2s, T.&P. Sur.	T.D. 3,690 ft.; lost bailer.

(Continued on Page 71)

COMPLETIONS IN WEST TEXAS

Glasscock County

California Oil Co.'s No. 1 O'Byrne, top pay 2,185 feet, shot 150 quarts 2,270-2,345 feet, initial production 690 bbls., total depth 2,345 feet.

Loving County

Erwin-Mabres' No. 1 Thorpe, abandoned, total depth 818 feet.

Pecos County

Cardinal Oil Co.'s No. 13 E. Tippett, top pay 462 feet, total depth 497 feet, plugged back to 484 feet, initial production 200 bbls. New State Oil Co.'s No. 1 Tippett, top pay 1,342 feet, initial production 100 bbls., shot 100 quarts 1,319-1,470 feet, total depth 1,470 feet.

Ward County

Abell Brothers' No. 1 Smith, top pay 2,350 feet, initial production 15 bbls., total depth 2,451 feet. White and others' No. 1 Bertner, dry and abandoned, total depth 755 feet.

COMPLETIONS IN PANHANDLE DISTRICT

Carson County

Skelly Oil Co.'s No. 13 East Schaffer, shot 300 quarts 3,073-3,230 feet, top pay 3,080 feet, initial production 536 bbls. swabbing and flowing, total depth 3,230

feet. The Texas Company's No. 1 Noel, old well deepened, old total depth 3,290 feet, new total depth 3,309 feet, increase in pay 3,290-95 feet, was making 65 bbls., new initial production 120 bbls. on pump.

Gray County

Continental Oil Co.'s No. 3 Finley, old well deepened, old total depth 2,902 feet, new total depth 2,944 feet, increase in pay 2,906 feet, initial production 600 bbls. on pump.

COMPLETIONS IN WICHITA FALLS DISTRICT

Archer County

Wilson Drilling Co.'s No. 1 Parrish Brothers, dry and abandoned, total depth 1,603 feet. R. J. Brown's No. 7 Plemmons, oil sand 699-713 feet, initial production 45 bbls., total depth 713 feet. Burns and Long's No. 6 Alexander, oil sand 1,409-14 feet, initial production 4 bbls., total depth 1,415 feet. Cable Oil Co.'s No. 1 Matlock, dry and abandoned, total depth 715 feet.

J. C. Cunningham's No. 1 Taylor, dry and abandoned, total depth 850 feet. H. C. Dean's No. 2 Abercrombie, show oil 1,199-1,200½ feet, initial production 15 bbls., total depth 1,200½ feet. Duncan and White's No. 1 Webb, dry and abandoned, total depth 780 feet. F. H. E. Oil Co.'s No. 1 Coffield, sandy lime 1,167-89 feet, initial production 25 bbls., total depth 1,189 feet. Gilliland and Rosser's No. 1 Echols, oil sand 1,336½-49½ feet, initial production 15 bbls. oil and 5 bbls. water, total depth 1,349½ feet. E. N. Goodrick's No. 1 Weinzapfel, temporarily abandoned 175 feet. J. P. Harris' No. 1 Andrews, temporarily abandoned 100 feet. Helena Oil & Gas Co.'s No. 1 Ray, oil sand 1,134-37 feet, initial production 205 bbls. in 24 hours, total depth 1,137 feet. Kimmell and Woofter's No. 10 Williams, dry and abandoned, total depth 1,451 feet.

Wayne Kine and others' No. 1 King, dry and abandoned, total depth 1,356 feet. McDonald and Williams' No. 1 Hasson, dry and abandoned, total depth 780 feet. A. P. Nicholson's No. 3 Taylor, dry and abandoned, total depth 756 feet. E. H. Sharp's No. 2 Coffield, sandy lime 1,152-67 feet, shot 10 quarts, initial production 25 bbls., total depth 1,167 feet. Texas Plains Co.'s No. 11 Terrell, oil sand 658-65 feet, initial production 40 bbls., total depth 665 feet. White Duncan's No. 11 Webb, oil sand 700-11 feet, initial production 150 bbls., total depth 711 feet. White Duncan's No. 1 Webb, oil sand 665-69 feet, initial production 25 bbls., total depth 669 feet. Wichita Production Co.'s No. 1 Stewart, dry and abandoned, total depth 1,350 feet.

Clay County

Developers Oil & Gas Co.'s No. 18 fee, temporarily abandoned, total depth 1,021 feet. R. N. Gable's No. 1 Waggoner, dry and abandoned, total depth 995 feet.

Jack County

Consolidated Oil Co. and others' No. 1 Wright, dry and abandoned, total depth 953 feet.

Wichita County

W. C. Chapman and others' No. 3 Parker, temporarily abandoned, location. Gray and Ferguson's No. 1 Sisk, dry and abandoned, total depth 840 feet. C. N. Clark and others' No. 2 Allen and Kemp, temporarily abandoned, total depth 452 feet. J. C. Clower's No. 16 Dobie, dry and abandoned, total depth 1,999 feet. J. & M. Hemay's No. 1 Hoozer, dry and abandoned, total depth 318 feet. Rathke Co.'s No. 2 Haggard, dry and abandoned, total depth 782 feet. Ryan Consolidated Oil Co.'s No. 1 Womack, dry and abandoned, total depth 1,856 feet.

Young County

Bohner Oil Corp.'s No. 11 Edwards, dry and abandoned, total depth 500 feet. Charles A. Daubert's No. 1 Weems, dry and abandoned, total depth 602 feet. Holbrock and Wood's No. 7 Watson, oil sand 563-575 feet, initial production 3 bbls., total depth 576 feet. Hunter Oil Corp.'s No. 5 Bloodworth, oil sand 1,076-88 feet, initial production 50 bbls., total depth 1,094 feet. HY Oil Co.'s No. 5 Larimore, oil sand 702-17 feet, initial production 105 bbls., total depth 717 feet. Iron Mountain Oil Co.'s No. 9 Tatum, oil sand 650-61 feet, initial production 43 bbls., total depth 657 feet.

Primrose Refining Co.'s No. 2 Barnett, dry and abandoned, total depth 706 feet. Guy C. Roley's No. 1 Morris, dry and abandoned, total depth 710 feet. E. R. Riggs' No. 2 McClure, dry and abandoned, total depth 536 feet. Guy H. Scholl's No. 1 Morris, dry and abandoned, total depth 660 feet. Simmons and Lively's No. 1 Drum, oil sand 449-70-76-85 feet, initial production 4 bbls., total depth 485 feet. Simmons and Lively's No. 3 Drum, dry and abandoned, total depth 601 feet. W. F. Snebold's No. 1 Christian, dry and abandoned, total depth 732 feet. United Producers Co.'s No. 3 Duncan, oil sand 926-29½ feet, initial production 24 bbls., total depth 929½ feet. Wooten and Reid's No. 1 Robinson, dry and abandoned, total depth 703 feet.

East Texas Fields

(Continued from Page 66)

three-quarter inch tubing choke, total depth 3,772 feet. Hunt Production Co.'s No. 5-D Bradford, top sand 3,555 feet, initial production 46 bbls. in 4 hours pumping, total depth 3,677 feet; No. 3-D Fair, top sand 3,640 feet, initial production 37 bbls. in one-quarter hour through 2-inch open tubing, total depth 3,654 feet; No. 3 A. P. Finney, top sand 3,685 feet, initial production 46 bbls. in 35 minutes through open 2-inch tubing, total depth 3,703 feet; No. 9 C. Young, top sand 3,643 feet, initial production 20 bbls. in one-quarter hour through open 2-inch tubing, total depth 3,690 feet.

Magnolia Petroleum Co.'s No. 2 W. P. Key, top sand 3,774 feet, initial production 70 bbls. in 50 minutes through open 2½-inch tubing, total depth 3,775 feet. Mid-Kansas Oil & Gas Co.'s No. 24 W. T. Grissom, top sand 3,624 feet, initial production 96 bbls. per hour on 2-inch lead, total depth 3,650 feet; No. 13 E. E. Moores, top sand 3,581 feet, initial production 64 bbls. per hour on 2-inch lead, total depth 3,667 feet; No. 10 M. A. Price, top sand 3,572 feet, initial production 54 bbls. per hour on 2-inch lead, total depth 3,644 feet; No. 2 Peter Tipps, top sand 3,654 feet, initial production 88 bbls. per hour on 2-inch lead, total depth 3,656 feet.

Richard and Watkins' No. 1 W. F. Neal, top sand 3,673 feet, initial production 30 bbls. per hour through open 2-inch tubing, total depth 3,717 feet. Sinclair Oil & Gas Co.'s No. 15 D. Ledbetter, top sand 3,568 feet, initial production 32 bbls. in 15 minutes through open 2½-inch tubing, total depth 3,605 feet; No. 8 Peter Tipps, top sand 3,660 feet, initial production 90 bbls. per hour through 2½-inch tubing, total depth 3,666 feet. Spansco Oil Co.'s No. 4 W. P. Brett, top sand 3,688 feet, initial production 65 bbls. per hour through open 2½-inch tubing, total depth 3,728 feet. Stanolind and Pure Oil Co.'s No. 25 W. H. Siler, top sand 3,579 feet, initial production 46 bbls. in 45 minutes through open 2½-inch tubing, total depth 3,658 feet; No. 28 W. H. Siler, top sand 3,634 feet, initial production 46 bbls. in 1 hour and 36 minutes through 2½-inch open tubing, total depth 3,703 feet. Sun Oil Co.'s No. 2 Alf Lee, top sand 3,657 feet, initial production 55 bbls. per hour through open tapered tubing, total depth 3,662 feet.

The Texas Company's No. 6 Kersh, top sand 3,605 feet, initial production 80 bbls. per hour through open 2-inch tubing, total depth 3,620 feet; No. 7 J. M. Price, top sand 3,557 feet, initial production 80 bbls. per hour through open 2-inch tubing, total depth 3,615 feet. Ward Oil Co.'s No. 5 A. P. Finney, top sand 3,674 feet, initial production 58 bbls. per hour through open tubing, total depth 3,715 feet.

Smith County

Pitner and West's No. 2-A L. S. Sartain, top sand 3,816 feet, initial production 120 bls. per hour through open 2½-inch tubing, total depth 3,818 feet. Pace Petroleum Corp.'s No. 1 Bateman, top sand 3,693 feet, initial production 50 bbls. per hour through open tubing making 10 to 20 per cent salt water, total depth 3,794 feet. Sun Oil Co.'s No. 1 Hudnott and Melton, top sand 3,668 feet, initial production 32 bbls. per hour through open tapered tubing, total depth 3,670 feet.

Upshur County

Humble Oil & Refining Co.'s No. 6-B Miller, top sand 3,680 feet, initial production 18 bls. in 15 minutes through three-quarters inch tubing choke, total depth 3,707 feet; No. 2 M. H. Reeves, top sand 3,659 feet, initial production 77 bbls. per hour through three-quarters inch tubing choke, total depth 3,673 feet; No. 12 I. D. Smith, top sand 3,596 feet, initial production 54 bbls. per hour through three-quarters inch tubing choke, total depth 3,627 feet. Peckham and others' No. 2 Bland, top sand 3,684 feet, initial production 60 bbls. per hour through three-quarters inch tubing choke, total depth 3,704 feet. Simms and Russ' No. 7 J. J. Flewellen, top sand 3,705 feet, initial production 75 bbls. per hour through 2½-inch open tubing, total depth 3,711 feet. Stanolind-Simms and others' No. 7-C J. J. Flewellen, top sand 3,667 feet, initial production 21 bbls. in 15 minutes through open 2½-inch tubing, total depth 3,680 feet. Steen Drilling Co.'s No. 4 J. F. Phillips, top sand 3,696 feet, initial production 45 bbls. per hour through 2½-inch open tubing, total depth 3,702 feet.

WILDCAT COMPLETIONS

Anderson County

Frazier and others' No. 1 H. L. Hudson, top Pecan Gap 2,927 feet, base 3,020 feet, top Austin chalk 4,029 feet, base 4,472 feet, dry and abandoned, total depth 5,124 feet.

Cherokee County

Marr Drilling Co. and Stanolind Oil & Gas Co.'s No. 1 Green, top Pecan Gap 3,755 feet, top Austin chalk 4,626 feet, base 4,802 feet, top Red Beds 4,832 feet, dry and abandoned, total depth 5,012 feet.

Henderson County

G. W. Murchinson and others' No. 1 S. G. Benton, top Pecan Gap 2,749 feet, base 3,977 feet, top Austin chalk 3,605 feet, base 3,977 feet, top Woodbine sand 4,404 feet, dry and abandoned, total depth 4,898 feet.

Hill County

C. Houseman's No. 1 J. F. Griffith, dry and abandoned, total depth 3,080 feet.

ROCKY MOUNTAIN RUNS

Average daily pipe line runs from fields in the Rocky Mountain territory for the week ending October 1 follow:

	Bbls.
WYOMING	
Salt Creek	18,212
Big Muddy	1,630
Badger Basin	40
Byron-Garland	990
Dallas-Derby	470
Dutton Creek	80
Ferris	20
Frannie	140
Grass Creek	1,240
Hamilton Dome	860
Hudson	340
LaBarge	1,470
Lance Creek	140
Lost Soldier	2,580
Midway	110
Oregon Basin	290
Osage	1,050
Pilot Butte	30
Rock River	980
Poison Spider	80
Teapot	30
Warm Springs	...
Total Wyoming	30,782
MONTANA	
Buckley-Border	620
Cat Creek	810
Cut Bank	70
Dry Creek	670
Kevin-Sunburst	4,130
Lake Basin	30
Pondera	1,290
Total Montana	7,620
COLORADO	
Florence	450
Fort Collins and Wellington	780
Iles Dome	590
Moffat	560
Orchard	210
Rangely	80
Tow Creek	260
Total Colorado	2,930
NEW MEXICO	
Artesia	324
Caprock	408
Hogback	410
Jal	996
Rattlesnake	700
Table Mesa	80
Eunice	502
Hobbs	25,017
Lea	2,378
Texas-Pacific	54
Total New Mexico	30,865
Total Rocky Mountain area	72,197
Total previous week	73,294
Difference	1,097

The Oil Man's Calendar

October

3-7—Buffalo, N. Y., National Metal Exposition and National Metal Congress, and American Society for Steel Treating.

3-7—Washington, D. C., National Safety Council.

4—New York, N. Y., Society of Terminal Engineers, Engineering Society Bldg.

4-6—Toronto, Canada, Society of Automotive Engineers, transportation meeting.

10-14—Atlantic City, N. J., annual convention, American Gas Association.

11-12—Louisville, Ky., Kentucky Petroleum Marketers Association.

15—Tulsa, American Chemical Society, Oklahoma section, Tulsa Club.

20—Excelsior Springs, Mo., National Association of Credit Men, Refiners Division.

25-27—Kansas City, Mo., Four State Convention, Hotel President.

(?) —Chicago, Ill., American Society of Mechanical Engineers (fuel division).

November

2-4—Indianapolis, Ind., Indiana Petroleum Association, Hotel Severin.

10—Los Angeles, Calif., California Natural Gasoline Association.

10-12—Atlanta, Ga., Southeastern Economic Conference.

15-17—Houston, Tex., thirteenth annual meeting, American Petroleum Institute.

December

5—New Orleans, La., tenth annual Asphalt Paving Conference, and Association of Asphalt Paving Technologists.

5-9—New York, N. Y., American Society of Mechanical Engineers.

5-10—New York, N. Y., National Exposition of Power & Mechanical Engineering.

6-8—Omaha, Neb., Nebraska Petroleum Marketers, Hotel Fontenelle.

(?) —Great Falls, Mont., Rocky Mountain Oil and Gas Association, Rainbow Hotel.

1933

February

15-17—Columbus, Ohio, Ohio Petroleum Marketers Association, Deshler-Wallick Hotel.

April

20-21—Cleveland, Ohio, National Petroleum Association, Cleveland Hotel.

June

26-30—Chicago, Ill., annual meeting, American Society for Testing Materials, Stevens Hotel.

New England Markets Make Gasoline Price Cut

(Continued from Page 23)

flash showing corresponding reductions at 23½ and 28½ cents per gallon, respectively.

Export inquiry was a little better, although buyers were still somewhat inclined to defer the placing of actual orders until the market undertone shows a greater degree of stability.

Neutral oils moved within comparatively narrow channels throughout the week, with prices remaining unchanged on all grades.

Gulf Export Market

Gasoline prices for export shipments were lower at the Gulf during the week, with the market quoted at 4¼ to 4½ cents per gallon for U. S. Motor and 60-62 400 endpoint, 4¾ to 4½ cents per gallon for 61-63 390 endpoint, and 4½ to 4¾ cents per gallon for 64-66 375 endpoint. The market position was still unsettled, however, and prices were more or less nominal, with the possibility that 4¼ cents might be done on any grade on a firm bid for a cargo.

The only export inquiry reported in the Gulf market during the week, aside from the usual small-lot business, was for a cargo of 8,000 tons of stabilized casinghead gasoline, 18-20 pounds vapor pressure, for November shipment to England. In as much as the Gulf market on this grade advanced a full cent per gallon to 5¼ cents during the week, however, it was not considered likely that this business would be placed immediately.

Kerosene continued in strong position at the Gulf, with prices remaining unchanged, and no cargo business developing during the period.

As of September 15, Rumanian exporters reduced prices on several products, f.o.b. Constanza, as follows: Gas oil, $6.89 per ton, off 25 cents; heavy gasoline, $12.37 per ton, off 4 cents; and lamp oil, $6.93 per ton, off 25 cents per ton.

Export trade circles are showing considerable interest in reports of a possible revival in producing and refining operations in Mexico, and the establishment by some major American companies of a new exporting base in the vicinity of Tampico.

Petroleum Exports

Export volume fell off somewhat locally during the week, with shipments principally limited to small quantities. Exporters reported a fair volume of inquiries in the market, however, and were more optimistic concerning the outlook for the closing quarter.

The following table shows exports of principal refined products from the port of New York for the past three weeks (all figures in gallons unless otherwise indicated):

	Week ended		
	Sept. 24	Sept. 17	Sept. 10
Gasoline	95,000	5,000	30,000
Naphtha	295,000	3,150,000	490,000
Kerosene	17,000	126,000	40,000
Fuel and gas oil	10,000	190,000	25,000
Lub oil	650,000	625,000	1,115,000
Pet., refined	210,000	140,000	498,000
	Pounds		
Petrolatum		35,000	8,000
Paraffin wax	775,000	2,385,000	775,000
Refined	470,000	190,000	130,000
Scale	27,000	98,000	15,000
Lub grease	910,000	786,000	625,000

Hostilities in Brazil are tending to slow down demand from that country, which is normally a rather heavy purchaser of American refined products.

Export operators were greatly interested in reports indicating the possibility of a monopoly on petroleum distribution in Cuba. The reports of the proposed monopoly were credited in trade circles here, notwithstanding reports from Havana contradicting earlier statements indicating that the monopoly had been tentatively offered to three large American oil companies now operating in Cuba.

Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended September 24 totaled 951,000 bbls., a daily average of 135,857 bbls., compared with 639,000 bbls., a daily average of 91,286 bbls. for the previous week, and a daily average of 102,071 bbls. for the four weeks ended September 24. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast ports—	Bbls.
New York	764,000
Philadelphia	110,000
Others	77,000
Total	951,000
Daily average	135,857
Daily average four weeks	102,071

There were no receipts at Gulf Coast ports during the week.

The week's imports were made up of 703,000 bbls. of crude oil and 248,000 bbls. of fuel oil.

Considerable interest is shown in trade circles here by reports of a pending transaction whereby the South American producing properties of one of the major American companies may be taken over by another leading unit in the world oil industry. If this deal should materialize, it is felt, there would be a further sharp drop in imports of crude and products, and a possible expansion of refining facilities in the Caribbean area on the part of the reported purchasing company. No details surrounding the proposed transaction have come to light as yet, however, and it is indicated that the transaction is still in its early stages. The probable outcome of the deal, it is expected, will be largely influenced by whatever action Congress may take at its coming session in regard to the plea by independent American producing interests for a higher tariff rate on imports of crude petroleum and refined products.

Reports of pending expansion of activity in Mexico have also aroused interest here because of the potential influence upon the import situation.

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic ports during the week ended September 24 were 282,000 bbls., a daily average of 40,286 bbls., against 190,000 bbls., or 27,143 bbls. daily, during the previous week and a daily average of 24,607 bbls. for the four weeks ended September 24. There were no receipts at Gulf Coast ports during the week. The week's receipts were made up of 42,000 bbls. at Baltimore, 75,000 bbls. at New York, and 165,000 bbls. at other ports, and comprised 92,000 bbls. of fuel oil and 190,000 bbls. of gasoline.

The following cargoes of California oil were reported afloat for East Coast ports at the close of the week:

For Bayonne: 72,000 bbls. of gasoline on the tanker New Jersey (The Texas Company boat).

For Fall River, Mass.: 79,000 bbls. of gasoline on the tanker S. C. T. Dodd (Standard Oil Co. of California boat), and 80,000 bbls. of gas oil on the tanker W. S. Miller (Standard Oil Co. of California boat).

For Chester, Pa.: 75,000 bbls. of gasoline on the tanker Sunoil (Sun Oil Co. boat).

For Provincetown, Mass.: 118,000 bbls. of gasoline on the tanker Southern Sun (Sun Oil Co. boat).

Three and Two on Lou Then the Well Came in

It was a tense moment in the fourth inning of that first world series game last week.

The Cubs had a two-run lead in the last half of the fourth inning. Combs had scored on Babe Ruth's single, and Babe was hanging onto first base. The mighty Gehrig was at bat.

Somebody had a fancy car with a radio and the crowd around the Lew Wentz test southwest of Perry, Okla., with nothing else to do, had gathered around the car.

Five balls passed over the plate. The count was three and two. The crowd held its breath and waited for the next pitch. It would tell the tale. Just then a grumble and a "whoosh" came from the near-by derrick and a column of mud, gas and oil hurtled upward. The well was flowing!

For the benefit of those in the crowd who at that moment turned eyes and ears far, far away from the howling bedlam of Yankee stadium in little old New York, The Oil and Gas Journal takes pleasure in announcing that Lou knocked a home run, scoring Ruth ahead of him.

Developments in Chicago to Create Better Feeling

(Continued from Page 22)

considered strong and slightly better in price.

More Cheering Influences

Although most of the benefits which are accruing to the oil industry appear as blessings in disguise, and a very effective disguise it is, there is no lack of actual facts and figures on the constructive side. Industrial activity is on the upgrade and has been sustained for nearly a month now.

Chicago steel producers have stepped up their schedules and report the best business in four months during September, while orders and specifications to mills are better than in the past three months. Other industrial revivals have not been quite so impressing, but a reflection is seen in the improved call for the heavier fuel oils. The United States Chamber of Commerce points out in its analysis of export figures for the first half of 1932, that "crude petroleum exports set an all-time high mark in the January-June period of this year. Shipments totaled 14,176,000 bbls., by far the largest volume ever shipped abroad during the first half of the year, exceeding any full year's exports prior to 1923." Probably the greatest forward step would be the elimination of the standing offer of gasoline on contract to distributors at three-eighths of a cent below the low. If this type of contract is abolished, as appears likely, the gasoline markets throughout this district are expected to reach the firm ground necessary for real improvement.

Gasoline Tank Car Prices

The gasoline tank car markets were practically unchanged at the beginning of this week. The new commercial discount contract introduced by Standard Oil Co. of Indiana went into effect Saturday without noticeable effect on the retail postings. There is considerable talk, on the contrary, of a possible movement soon to revise the service station markets upward in this district and the adjacent territory. The ranges of the 64-66 375 endpoint and the 68-70 360 endpoint gasolines were narrowed down an eighth of a cent making the new prices 4½ to 4⅝ cents for the first, and 4⅝ to 4¾ cents for the second. The U. S. Motor and 400 endpoint gasolines were unchanged with 3⅝ to 3⅞ cents quoted on the U. S. Motor material, and 3¾ to 4 cents asked for the 60-62 400 endpoint gasoline. Blended motor fuels are reflecting the same conditions met in the gasoline markets, that is, slow jobber buying. Blending naphthas are quoted to the trade as follows: 50-52 437 endpoint of 55 octane, 3½ cents; 50-52 420 endpoint of 63 octane, 3⅞ to 4 cents; 50-52 430 endpoint of 72 octane number, 4¾ to 4⅞ cents; 52-54 437 endpoint of 63 octane number, 3⅞ to 4 cents; 52-54 400 endpoint of 72-75 octane number, 4⅝ cents.

A check of the last named naphtha showed the following: Gravity, 55.1; initial, 104°; endpoint, 402°; octane number, 72.3; gum, 3.2 m.g. per 100 c.c.s.; recovery, 97.5; residue, 1.3; loss, 1.2; vapor pressure, 7.5. Evaporated at: 140°, 4.2 per cent; 158°, 7.7 per cent; 212°, 21.9 per cent; 284°, 51.5 per cent, and 392°, 97.2 per cent.

Naphtha Tank Car Markets

The naphtha tank car markets this week show a tendency on the part of a majority of sellers toward the low of the price ranges in the light cleaners, lacquer diluents, rubber solvent, Stoddard, petroleum thinner and V.M.&P. naphtha. However, there is apparently no material moving under these prices.

Kerosene Tank Car Markets

The kerosene tank car markets appear to be in a better statistical position than last week and several buyers report that some of their sources have returned orders. Distillates were showing a better tone although some adverse developments may crop up in the heating oil tank wagon markets. Several burning oil distributors have failed to meet the recent tank wagon advances. Fuel oils were stronger especially the lighter grades. A Coffeyville, Kans., refiner advanced his 26-30 zero grade to 90 cents, f.o.b. Coffeyville last week, and more distributors are having to meet refiners' quotations.

East Central Texas Wildcats

(Continued from Page 66)

Armstrong Bros.' No. 1 John Lee Winn, 1,650 ft. from E and 150 ft. from S of Orland, Orlo Wheeler Sur. ....S.D. 1,435 ft.

Clark Brooks' No. 1 Anderson, SE cor. of 3,000-ac. tract, 10 miles SW of Wachatchie, E. C. Branch Sur. .....S.D. 1,050 ft.

Paris Oil Co.'s No. 1 O. S. Bain, 1,500 ft. from S line and 300 ft. from W line of 60-ac. lease, R. M. Williams Sur. .....T.D. 924 ft.

FRANKLIN COUNTY

Tom Harper's No. 1 fee, 150 ft. from N line and 200 ft. from E line of 116-ac. tr., W. M. Dawson Sur. ....T.D. 3,004 ft.; setting 5 3/16-in. csg.

Fred Price et al's No. 1 Mattie E. Ferguson, 150 ft. from S and W lines of tract and survey, Z. Rogers Sur. .....Location.

FREESTONE COUNTY

Clyde Creighton's No. 1 Holley Bros., 854 ft. from W line and center of N and S lines of lease, A.B.M. Sur. .....S.D. 3,669 ft.

GREGG COUNTY

Angle and Kuy Kendall's No. 1 John Curnigan, 871 ft. S and 496 ft. W of NW cor. of Gulf's Nichols lease, I. Beaty Sur. .....Waiting on cmt. to set 3,691 ft.; T.D. 3,717 ft.

Arkansas Fuel Oil Co.'s No. 1 E. Killingsworth, 330 ft. from N and W lines of lease, William Robinson Sur. .....Location.

W. E. Barker et al's No. 1 Richey, 122 ft. from N line and center of E and W lines of lease, William Carlton Sur. .....Location.

Blue Star Oil Co.'s No. 6-A Sabine River, 14 ft. S and 40 ft. W of NW cor. of Gulf's Reeves lease, State Lands Sur. .....Drlg. 2,910 ft.

Blue Star Oil Co.'s No. 3-H Sabine River, 1,650 ft. NW up river from E line of Tract No. 3, State Lands Sur. .....Drlg. 2,760 ft.

Blue Star Oil Co.'s No. 7-J Sabine River, 660 ft. W up river from No. 7-K, State Lands Sur. .....Drlg. 2,580 ft.

D. F. Buffington's No. 1 S. L. Dansby, 150 ft. from S line and 1,700 ft. from E line of 30-ac. lease, W. P. Chisum Sur. .....Drlg. 2,300 ft.

Cap Rock Oil & Gas Co.'s No. 1 Mrs. N. Crane, center of 1.84-ac. tract, M. V. Winkle Sur. .....Drlg. 3,435 ft.

Carroll and Blaine's No. 1 A. King, 200 ft. E of No. 1 S. King, M. V. Winkle Sur. .....S.D. 3,533 ft.

C. M. Cope's No. 1 Doctor Crane, 50 ft. out of NW cor. of S half of Blk. No. 139, M. V. Winkle Sur. ..Drlg. 2,680 ft.

Corbin et al's No. 1 A. H. Tubbs, 330 ft. from S and W lines of 50-ac. lease, D. Sanches Sur. .....Fishing for tubing; T.D. 3,596 ft.

Dorian and Broadman's No. 1 Rudder, 103 ft. N and 55 ft. W of most southerly SW cor. of Stanolind's Persons lease, W. H. Castleberry Sur. .....S.D. 3,609 ft.

Doctor Duncan's No. 2 Duncan, 200 ft. from S line and 308 ft. from W line of lease, G. F. Penn Sur. .....Drlg. 3,125 ft.

East-Whaley Oil Co.'s No. 1 Elder, 60 ft. from N line and 100 ft. from E line of Blk. No. 19, M. V. Winkle Sur. ..... Spudding.
Fair and Thompson's No. 2 D. Carr, 330 ft. from N line and 990 ft. from W line of lease, M. McCurry Sur. .... Drlg. 2,525 ft.
Lewis Godlin's No. 1 E. L. Walker, 330 ft. N of road, 330 ft. from E line of 80.2-ac. tract, M. Dillard Sur. .. Derrick.
Guinn Petroleum Co.'s No. 1 J. S. and F. Elder, 200 ft. NE of Solar's No. 1 Elder, and 450 ft. SE of Martin's No. 1 Elder, M. V. Winkle Sur. ..... Derrick.
Hall et al's No. 1 C. Dickson, 330 ft. from N and W lines of lease and 330 ft. S and E of NE cor. of Simples' lease, James Hillard Sur. ..... Running csg. 3,540 ft.
A. R. Hancock's No. 1 Bramley, 110 ft. from N and S lines and 110 ft. from W line of 4.6-ac. lease, C. H. Alexander Sur. ..... Waiting on cmt. to set; T.D. 3,512 ft.

Hensley and Dutton's No. 1 L. Howard, center of lease, L. Howard Sur. ..... Rig up.
Humble Oil & Refining Co.'s No. 1 J. P. Owens, 660 ft. from N line and 330 ft. from W line of lease, D. Meredith Sur. ..... Coring 3,628 ft.
Island Oil Co.'s No. 2 J. W. Akin, center of N and S lines and 575 ft. N of Sinclair Prairie's No. 9-B Akin, W. H. Castleberry Sur. ..... Drlg. 3,200 ft.
S. J. Jordan's No. 1 E. L. Walker, 660 ft. W of SE cor. of lease and 155 ft. from S line and 155 ft. from river, E. A. Lambert Sur. ..... S.D. 3,592 ft.
Knox et al's No. 1 S. Smith, 200 ft. E of Golding and Murchison's No. 2 Smith and 89 ft. NW of NW cor. of Sun Rollins 200-ac. lease, Mary Scott Sur. .... S.D. 3,625 ft.
T. W. Lee's No. 1 School Lot, 167 ft. N of J. C. Vernon's No. 1 Cemetery, T. Johnson Sur. ..... Drlg. 1,941 ft.
Lechner and Hubbard's No. 1 N. Tuttle, 37 ft. from N and S line and 275 ft. from W line and 225 ft. from E line of .8-ac. tract, W. H. Castleberry Sur. .... Rig up.
Lester and Duffield's No. 1 J. Moore, 330 ft. from W line of lease and 660 ft. S of Shell's No. 18 Moore, F. W. Johnson Sur. ..... Rig up.
Lewis et al's No. 1 R. M. Woods, 2,200 ft. N and 375 ft. E of SW cor. of survey, H. R. Hokit Sur. ..... S.D. 888 ft.
J. F. Lucey, receiver's No. 2 Anderson, S offset to Silver Star's No. 2 Anderson, C. H. Alexander Sur. ..... Drlg. 3,515 ft.
Madalyn Oil Co.'s No. 1 J. V. Rossen, 550 ft. N and S and 100 ft. E and W of tract, T. Johnson Sur. ..... Derrick.
McBride et al's No. 1 Tubbs, 330 ft. from N line and center of E and W lines of 6-ac. lease, D. Sanches Sur. ..... Derrick.
C. C. McCormick's No. 1 S. Key, 1,000 ft. from S line of survey and 100 ft. from W line of survey, L. J. Rigsby Sur. ..... Rig up.
Newman et al's No. 1 O. Prothro, 330 ft. from E line of lease and center of N and S line of 8.5-ac. tract, J. Blair Sur. ..... Rig up.
J. B. Patty et al's No. 1 Farrell, 330 ft. S and 175 ft. W of NE cor. of E 50 acres of 148-ac. tract, D. Sanches Sur. ..... Derrick.
E. A. Payne et al's No. 1 R. M. Woods, 20 ft. from S line and 31 ft. from W line of 2.13-ac. lease, H. R. Hokit Sur. ..... Drlg. 3,633 ft.
Pennsylvania Oil & Gas Co.'s No. 2 T. B. Harris, 330 ft. from S line and 150 ft. from W line of 20-ac. lease, J. Ruddle Sur. ..... Drlg. 3,424 ft.
Porter and Badgett's No. 1 School Lot, 250 ft. due E of Sam P. Shelbourne's No. 2 Crim Mercantile . .... Waiting on cmt. to set.
Producers Investment Co.'s No. 1 King, 20 ft. from N line and 125 ft. from W line of Blk. No. 117, M. V. Winkle Sur. ..... Derrick.
Raddatz' No. 4 Sabine River, Tract No. 8, 300 ft. W and 100 ft. S of SE cor. of Shell's Stitchcomb lease ..... Bldg. rig.
Rhodes Drilling Co.'s No. 1 Sabine River, Tract No. 4, 330 ft. from W line of lease and NE of Imperator's No. 1 Southworth ..... Driving piling.
Rhodes Drlg. Co.'s No. 4 Sabine River, Tract No. 4, 280 ft. N of The Texas Company's No. 6 Cole, State Lands Sur. ..... Set surface csg.
Rhodes Drlg. Co.'s No. 1 Sabine River, Tract No. 5, 366 ft. due east of Sun's No. 4 Cole, State Lands Sur. ..... Waiting on cmt. to set.
Rhodes Drlg. Co.'s No. 1 Sabine River, 330 ft. from E line and 378 ft. NW of Sinclair Prairie's No. 8-B A. A. King, Tract No. 1, State Lands Sur. ..... Derrick.
J. J. Roberts' No. 1 H. S. and F. Elder, 90 ft. from SW line and 90 ft. from E line of 1-ac. lease, M. V. Winkle Sur. ..... Waiting on standard rig; T.D. 3,585 ft.
Russell Petroleum Co.'s No. 2 M. T. Cole, 330 ft. from N and E lines of lease, J. Duncan Sur. ..... Fishing 2,940 ft.
Ruston Drlg. Co.'s No. 1 Sabine River, Tract No. 3, 330 ft. from E line of lease and 50 ft. N of S bank of river, State Lands Sur. ..... Driving piling
South Gulf Production Co.'s No. 1 Cemetery, 225 ft. NW of Barnsdall's No. 1 McGrede, on one-half acre lease, D. Sanches Sur. ..... S.D. 200 ft
Dr. E. L. Walker's No. 1 fee, center of Blk. No. 64, M. Dillard Sur. ..... Drlg. 3,546 ft.

HENDERSON COUNTY

B. L. Green et al's No. 1 M. H. Gussett (old well drilled deeper), 150 ft. from N line and 1,000 ft. from W line of 105.5-ac. tract, 3 miles SW of Mabank, L. D. Stover Sur. ..... S.D. 3,147 ft.
Dr. J. T. Kennon et al's No. 1 Rowe & Baker, 1,320 ft. from N line and 150 ft. from W line of survey and tract, Josiah T. Childress Sur. ..... S.D. 920 ft.
H. H. Meyer's No. 1 M. E. Olson, 2 miles S of Brownsboro tract in NW cor. of survey, George Wilson Sur. ..... S.D. 3,150 ft.

HILL COUNTY

T. J. Spikes' No. 1 M. H. Davis, 150 ft. from S and E lines of 55-ac. tract, H. R. Alexander Sur. ..... S.D. 1,319 ft.

HOPKINS COUNTY

Burgess and Sinson's No. 1 First Natl. Bank, 470 ft. N and W of SE cor. D. Buie Sur., but located in the H.E.P.&P.R.R. Sur. ..... Derrick.
Columbia Oil & Gas Co.'s No. 1 McCloud, 150 ft. from S line and 200 ft. from E line of lease, Holbrook Sur., elev. 485 ft. ..... Derrick.
Roark et al's No. 1 Taylor, 220 ft. from N and W lines of 80-ac. tract, in the John Polk Sur. ..... S.D. 540 ft.

HUNT COUNTY

A. Kelsey et al's No. 1 W. R. Berry, 450 ft. from S line and 300 ft. from E line of 139-ac. tract, J. Roads Sur. ..... Location.

KAUFMAN COUNTY

George Anderson's No. 1 W. N. Moody, 1,980 ft. S. 45 deg. E and 660 ft. S. 45 deg. W of NW cor. of survey, George Heider Sur. ..... Coring 3,180 ft.
Standy Darnell et al's No. 1 Sally Pannill ..... T.D. 2,485 ft.

LAMAR COUNTY

G. W. Davy et al's No. 1 McGustion, 450 ft. from S line, 450 ft. from W line of farm and survey, Galet Wood Sur. ..... Temp. abnd. 3,605 ft.
Doyle and Jondeau's No. 1 Martin, 990 ft. from N line and 330 ft. from E line of tract, Joseph Deck Sur. ..... Rig up; T.D. 2,446 ft.

LEON COUNTY

Alladay et al's No. 1 W. R. Thompson, 330 ft. from N line of survey and 330 ft. from E line of 98-ac. tract, N. M. Allen Sur. ..... S.D. 690 ft.
Shell-Penn & Black's No. 1 W. M. Phillips ..... Drlg. 4,286 ft.

MORRIS COUNTY

Joiner & Harris Drilling Co.'s No. 1 Clayton Brown, 1,625 ft. N of most easterly SW cor. of survey, William M. Coffey Sur. ..... Derrick.
Leonard's (Tucker-Fullwood) No. 1 P. M. Staggers, 450 ft. from N line and 150 ft. from E line of 65.5-ac. tract, J. D. Nelson Sur. ..... T.D. 3,593 ft.

POLK COUNTY

Cannon et al's No. 1 Roberts, 10 miles N of Livinston, Romera Sur. ..... Rig up and shut down.

RAINS COUNTY

Harris et al's No. 1 Markovitz, 660 ft. from N and E lines of 106-ac. tract, 2 miles SE of Emory, Charles Veipoler Sur. ..... Drlg. 2,410 ft.

RED RIVER COUNTY

Concord Oil Co.'s No. 1 J. R. Dallahunty, 500 ft. from N of Isaac Moore Sur. and 200 ft. E of E line of Robert Glass Sur. ..... S.D. 2,573 ft.

ROCKWALL COUNTY

Bucanner Oil Co.'s No. 1 H. L. Lofland, center of 69-ac. tract in W. M. Bird Sur. ..... Set 10-in. csg. 130 ft.

RUSK COUNTY

Barnsdall Oil Co.'s No. 1 Gill, 330 ft. from N and E lines of lease, R. W. Smith Sur. ..... Waiting on cmt. to set.
Boggs et al's No. 1 J. Border, 250 ft. S of Wyche's No. 1 Arnold on 5-ac. lease, P. W. Holmes Sur. ..... Drlg. 3,690 ft.
Brooks Petroleum Co.'s No. 1 Mayfield, Daniel Clark Sur. ..... Top sand 3,623 ft.; waiting on standard rig; would not flow; T.D. 3,702 ft.
T. E. Castle's No. 1 R. H. Gary estate, 3,960 ft. from N line and 5,280 ft. from W line of survey, 10 miles S of Henderson, A. Latham Sur. ..... S.D. 3,790 ft.
J. Guinn's No. 1 Neal Cooper, center of Blk. No. 36, T. J. Moore Sur. ..... Waiting on standard rig; T.D 3,660 ft.
Gulf Production Co.'s No. 6 Sexton Estate, midway between Nos. 4 and 5, M. McCabe Sur. ..... Drlg. 1,650 ft.
Fred Hanbury's No. 2 M. L. Thompson, 266 ft. from N and E lines of 10-ac. lease, M. J. Pru Sur. ..... Drlg. 3,119 ft.
Harris and Russell's No. 1 T. W. Harris, 330 ft. from S line and 660 ft. from W line of most southerly SW cor. of 160-ac. tract, 3 miles SW of Henderson, W. G. Davis Sur. ..... Derrick.
Hasting and Dodson's No. 1 E. B. S. Florey, 257 ft. from S line and 287 ft. from E line of 25-ac. lease, P. W. Holmes Sur. ..... Drlg. 2,350 ft.
Hathaway et al's No. 1 Gray, J. M. McLain Sur. ..... S.D. 3,640 ft.
Heiden-Rodgerson et al's No. 1 Barton and Birdwell, N offset to Reisinger et al's No. 1 Barton, W. G. Tutt Sur. ..... T.D. 3,792 ft
J. Jeagens' No. 1 Needham, 330 ft. from N line of lease and 330 ft. from NE and 400 ft. from SE of survey, J. H. Chambers Sur. ..... S.D. 1,414 ft.
Joy McCartney's No. 1 Deason, 150 ft. from S and W lines of lease, Juan Ximenes Sur. ..... Drlg. 1,000 ft.
Murray Oil Co.'s No. 1 H. Sexton, center of 3-ac. lease, being center of 3-ac. of 10-ac. strip, M. McCabe Sur. ..... Waiting on cmt. to set; T.D. 3,739 ft.
Overton Refining Co.'s No. 1 Curtis Pool, SE offset to London's No. 1 Maxwell, center of 1.5-ac. tract, F. Cordova Sur. ..... Rig up.
Paulett et al's No. 1 Ed Sparks, 350 ft. from E, 150 ft. from S of survey, L. C. Riggs Sur. ..... S.D. 1,465 ft.
Pointer and Duncan's No. 1 Hale, center of 1-ac. gin lot, John Darley Sur. ..... S.D. 3,745 ft
W. F. Reynolds' No. 1 H. Stoddard, 330 ft. from S line of road, 220 ft. from N line of lease, and 330 ft. from W line of Creek, Juan Ximenes Sur. ..... S.D. 3,630 ft.
Ross Seward's No. 1 Burton, J. J. Y'Barbo Sur. ..... T.D. 3,387 ft.
Fred Shields and Florence Oil Co.'s No. 1 R. L. Buckner, 330 ft. from N and W lines of 320-ac. tract and survey, John E. Davis Sur. ..... Derrick.
Smith and Sikes' No. 1 Frederick, 150 ft. S of SE cor. of E. D. Oil Co.'s Alford lease, I. G. Parker Sur. .... Drlg. 3,515 ft.
Smith, receiver's No. 1 Ras Pool, center of 2-ac. lease, M. J. Pru Sur. ..... Drlg. 2,045 ft.
Snider and Spradner's No. 1 Brightwell, 650 ft. from S line and 150 ft. from W line of lease, R. W. Smith Sur. ..... Waiting on cmt. to set 3,566 ft.
Stewart and Duffy's No. 1 Solar Jackson, 330 ft. from N and E lines of lease, P. W. Holmes Sur. ..... Derrick.
William Travis' No. 1 J. F. Horton, 330 ft. S and E of NW cor. of lease, J. C. Barnett Sur. ..... Derrick.
R. H. Vise's No. 2 W. D. Alford, 330 ft. from S line and 990 ft. from E line of 164-ac. tract, H. B. Dance Sur. ..... Rig up.
Karl Witt et al's No. 1 H. B. Leverett, 140 ft. from S line and 110 ft. from W line of 2.5-ac. lease, J. Lindley Sur. ..... Drlg. 1,000 ft.
Clint Wood Drilling Co.'s No. 2 Scroggins, 330 ft. from S line and center of E and W lines of lease, W. A. Elliott Sur. ..... Rig up.

SMITH COUNTY

Cockburn and Hooker's No. 2 Lula Jackson, 330 ft. from S and E lines of 76-ac. lease, E. Daniels Sur. .. Rig up and S.D.
Golden Eagle Oil Co.'s No. 1 T. B. Collier, 137 ft. from S line and 150 ft. from E line of lease, J. Jordan Sur. ..... Derrick.
Golden Eagle Oil Co.'s No. 1 E. E. Moore, 330 ft. from N and E lines of 8-ac. lease, Juan Vargus Sur. .... Derrick.
Golden Eagle Oil Co.'s No. 1 L. S. Sartain, center of 5-ac. lease, J. Jordan Sur. ..... Drlg. 3,075 ft.
Graham Bros.' No. 1 S. S. Cooke, 400 ft. from N line and 175 ft. from W line of Blk. No. 8, J. Vargus Sur. ..... Waiting on cmt. to set 3,737 ft.
W. B. Hinton's No. 7 Mayfield, 330 ft. from S line of lease and N offset to K. O. T.'s No. 4 Cooke, J. Jordan Sur. ..... Drlg. 3,400 ft.
Hooper et al's No. 1 Lule Jackson, 330 ft. S and 530 ft. E of most northerly SW cor. of Monroe Shell Robinson lease, E. Daniels Sur. ..... S.D. 3,815 ft.
Humble Oil & Refining Co.'s No. 7 M. C. Thompson, 330 ft. from N and W lines of lease, I. Moore Sur. ..... Rig up.
Joiner et al's No. 1 C. S. Jackson ..... T.D. 4,045 ft.; S.D.; prepare to abnd.
Alex McCutchin's No. 1 Jessie Cole, 108 ft. from S line and 110 ft. from E line of 1.27-ac. lease, J. Jordan Sur. ..... Derrick.
McRabie et al's No. 1 C. P. Hamilton, 330 ft. from N and E lines of 255-ac. tract, Jackson Rector Sur. .... Derrick.
Mundt et al's No. 1 W. E. Murray, 330 ft. from S and E lines of lease, 5 miles SE of Tyler, Marshall Wynn Sur. ..... Drlg. 3,625 ft.
Rabe et al's No. 1 Bateman, 332 ft. from S line and 278 ft. from E line of 15-ac. lease, James Jordan Sur. ..... Set csg.; T.D. 3,794 ft.
Sun Oil Co.'s No. 1 Hudnott and Melton, 2,310 ft. from N line and 330 ft. from E line of lease, M. D. L. S. Coy Sur. ..... T.D. 3,670 ft.
Sun Oil Co.'s No. 1 Mattie Burns, 330 ft. from S and E lines of lease, Juan Vargus Sur. ..... Location.
Alph Tillman et al's No. 1 Jessie Cole, 127 ft. from E line and 375 ft. from N line of 32-ac. lease, center of 5-ac. lease, James Jordan Sur. ..... Waiting on cmt. to set; T.D. 3,761 ft.
Virgo Oil Co.'s No. 1 Carson, 355 ft. from N line and center of E and W lines of 4.85-ac. lease, B. W. Campbell Sur. ..... Prepare to test; T.D. 3,805 ft.

Weaver et al's No. 3 T. O. Wright, 150 ft. from W line and center of N and S lines of 12-ac. lease, Juan Vargus Sur. ..... Drlg. 2,750 ft.
C. K. West's No. 2 Sartain, 220 ft. from S and W line of lease, J. Jordan Sur. ..... Location.

TITUS COUNTY

Perry V. Cook's No. 1 M. C. Rogers, center of SW of Moore Sur. ..... T.D. 4,212 ft.

UPSHUR COUNTY

J. P. Evans et al's No. 1 Bell, 700 ft. from N line and 900 ft. from E line of 60-ac. lease, William Fadden Sur. ..... Rig up.
Everetts Oil Co.'s No. 4 A. J. Sanders, 330 ft. from S and W lines of lease, T. Allen Sur. ..... Derrick.
Lewis Godlin's No. 2 J. T. Mackey, 660 ft. SW of No. 1 and 330 ft. NW of highway ..... Location.
Pat Hudson et al's No. 1 D. F. Smith, 330 ft. out of SE cor. of W 100 acres of the N 200 acres of the 272-ac. lease, 3 miles E and 1½ miles N of Cranfill & Reynolds' No. 1 Rash, John Denson Sur. ..... Waiting orders 3,710 ft
J. E. Mabee et al's No. 3 Whitehurst, 330 ft. from N and W line of lease, McKinley and Williams Sur. ..... Derrick.
Ransom and Sheppard's No. 1 Stiles, 330 ft. from S line and center of E and W lines of 3¼-ac. lease, William King Sur. ..... Location.
Scott & Ashford's No. 1 Duphrates, 772 ft. from N line and 2,805 ft. from E line of lease, Del Torres Sur. ... S.D. 3,651 ft.
M. L. Stevens et al's No. 1 J. Hargroves, 330 ft. from S line and center of E and W lines of lease, M. Mann Sur. ..... Rig up.
Turnbow's No. 1 D. C. Shelton, center of 2½-ac. tract, Wm. King Sur. ..... Derrick.
Twin Oil Co.'s No. 2 C. J. Mackey, 330 ft. from S line of lease and 660 ft. W of No. 1, J. M. Pineda Sur. ..... Rig up.
Wadley and Evans' No. 1 W. S. Jones, 330 ft. from S and E lines of 100-ac. lease, James M. Dunn Sur. .... Drlg. 2,740 ft.
Watson's (formerly Kinsey) No. 1 D. F. Smith, 466 ft. from S line and 1,165 ft. from E line of 266-ac. tract, J. R. Davis Sur. ..... S.D. 1,856 ft.

VAN ZANDT COUNTY

Barton et al's No. 1 C. L. Hubbard, 600 ft. out of NE cor. of Hubbard 225-ac. tract, 3½ miles S of Canton, M. J. McCadena Sur. ..... S.D. 2,405 ft.
Kelly O. & G. Co.'s No. 1 Lemsford, center of Lemsford tract, John Conner Sur. ..... S.D. 2,300 ft.
Lyman et al's No. 1 J. C. Stewart, 150 ft. from N line and 650 ft. from W line of 90-ac. tract, A. McPhail Sur. ..... Derrick.
Pure Oil Co.'s No. 3 J. T. Taylor, 320 ft. E of W line and 250 ft. N of S line, John Walling Sur. ..... Drlg. 2,700 ft.
Pure Oil Co.'s No. 4 C. C. Stewart, 225 ft. N of S line and 225 ft. E of W line of lease, A. McPhail Sur. .... Drlg. 760 ft.
Pure Oil Co.'s No. 2 Wylie Enas, 150 ft. N of S line and 225 ft. E of W line of lease, J. Prado Sur. ..... Drlg. 2,648 ft.
Pure Oil Co.'s No. 3 A. D. Clark, 225 ft. S of N line and 218 ft. W of E line of lease, A. H. Wiley Sur. ... Drlg. 2,595 ft.
Pure Oil Co.'s No. 2 A. D. Clark, 225 ft. S of N line and 218 ft. E of W line of lease, A. H. Wiley Sur. ..... Cmt. setting 2,797 ft.
Pure Oil Co.'s No. 3 W. E. Morris, 250 ft. S of N line and 250 ft. E of W lines of lease, John Walling Sur. ..... Testing 2,986 ft.
Pure Oil Co.'s No. 6 L. M. Brawner, 250 ft. N and 200 ft. W of NE cor. of W. F. Swain 40-ac. tract, John Walling Sur. ..... Cmt. setting 2,747 ft.
Pure Oil Co.'s No. 4 A. F. Magers, 250 ft. S and 200 ft. W of NW cor. R. V. White Sur., 15.5-ac. tract in Nacogdoches County School Land Sur. ..... Coring 2,820 ft.
Pure Oil Co.'s No. 5 D. R. Howell, 250 ft. N of S line and 250 ft. E of W line of Howell 60-ac. lease, H. V. Moore Sur. ..... Drlg. 2,542 ft.
A. C. Rowan's No. 1 W. E. Price, 150 ft. from N line and 150 ft. from W line of 28-ac. tract, John Walling Sur. ..... S.D. 2,865 ft.
Roy Stumpff's No. 1 M. I. Riggs, 169 ft. from E line and 250 ft. from S line of tract No. 2 and 330 ft. from E line of lease, 4 miles NE of Van, William Daniel Sur. ..... Rig up.
The Texas Company's No. 7 R. A. Tunnell, 787 ft. S of N line and 200 ft. W of E line of lease, John Walling Sur. ..... Drlg. 2,807 ft.
Van Oil Association's No. 1 Tankersley, 200 ft. from E and 1,000 ft. from S of farm, L. Landers Sur. ..... T.D. 2,850 ft.
C. O. Weir's No. 1 W. B. Tunnell, 150 ft. from N and W lines of lease, A. H. Wiley Sur. ..... Location.

WOOD COUNTY

De Canther's No. 1 N. L. McLain, 350 ft. from N line and 642 ft. from E line of tract, Sam Brooks Sur... T.D. 3,835 ft. (corrected).
W. B. Saulsbury's No. 1 T. H. Peters, 600 ft. from S line and 200 ft. from E line of 320-ac. tract and survey, 4 miles E of Mineola, W. B. McNutt Sur..... Rig up.
Talko Oil Co.'s No. 1 G. T. Ross, B. L. Smith Sur. ..... Fishing 3,840 ft.
Wood County Dev. Co.'s No. 1 Davis, approximately 180 ft. from S line of 160-ac. tract and 2½ miles S of Kantes in Sarah McDonald Sur. ..... S.D. 2,700 ft.

Wildcat Operations in West Texas

(Continued from Page 67)

Phillips Pet. Co.'s No. 1 Scharbauer, 990 ft. from S and 330 ft. from W Sec. 43, Blk. 44, Twp. 2s, T.&P. Sur... Drlg. 3,365 ft.
Thomas et al's No. 1 Edwards, 330 ft. from S. 3,310 ft. from E. Sec. 38, Blk. 42, Twp. 3s, T.&P. Sur. ..... S.D. 3,200 ft.
H. F. Wurtz' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW Sec. 16, Blk. 46, Twp. 3s, G. M. M.Br.&A. Sur. ..... S.D. 3,605 ft.

EL PASO COUNTY

Tri-State Oil Co.'s No. 1 Bobadella, 1,325 ft. from S and E lines Sur. 254, S.F. No. 7,247 ..... Drlg. 3,200 ft.

FISHER COUNTY

Cranfill & Reynolds' No. 1 George, 400 ft. from N and 380 ft. from E. Sec. 200, Blk. 1, B.B.B.&C. Sur. ..... Drlg. 6,250 ft.; salt water 6,205 ft.
Southern Oil Co.'s No. 1 Purdue, 990 ft. from S and E Sec. 202, Blk. B, B.B.&C. Sur. ..... S.D. 2,560 ft.

GLASSCOCK COUNTY

Continental Oil Co.'s No. 2 Hart-Phillips, 660 ft. from N, 1,980 ft. from W, Sec. 24, Blk. 33, Twp. 2-s, T.&P. Sur. ..... S.D. 2,510 ft.; plugged back to 2,455 ft. and shot twice; no gauge.
B. C. Mann's No. 1 Moore, C NE, Sec. 11, Blk. 35, Twp 3s, T.&P. Sur. ..... Fishing 3,015 ft.
Phillips Pet. Co.'s No. 1 Baker, 150 ft. from N and 1,520 ft. from E, Sec. 21, Blk. 33, Twp. 2s, T.&P. Sur. ..... Drlg. 845 ft.
Tribal Oil Co.'s No. 2 Edwards, 2,292 ft. from W and 330 ft. from S, Sec. 16, Blk. 33, Twp. 2s, T.&P. Sur.... T.D. 2,100 ft.; T.P. 2,085 ft.; to run csg.

HOWARD COUNTY

American-Maracaibo's No. 5-A Settles, 1,896 ft. from N. 1,884 ft. from W, Sec. 6, Blk. 32, T.&P. Sur. ..... S.D. 185 ft.
Green O. & R. Co.'s No. 1 Denman, 990 ft. from S and 2,310 ft. from W. Sec. 14, Blk. 30, Twp. 1s, T.&P. Sur.. Spudded and S.D.
Myers et al's No. 1 Denman, 2,305 ft. from S and 2,320 ft. from E Sec. 14, Blk. 30, Twp. 1s, T.&P. Sur. ..... S.D. 1,030 ft.
McCastin-Smith's No. 1 Roberts, 2,440 ft. from N and 648 ft. from E, Sec. 128, Blk. 29, W.&N.W. Sur. ..... Rigging up.
Mid-Continent Oil & Gas Co.'s No. 1 Denman, 990 ft. from S and 330 ft. from E Sec. 10, Blk. 30, Twp. 1s, T.&P. Sur. ..... Location.
Pure Oil Co.'s No. 13 Chalk, 330 ft. from N and E, Sec. 125, Blk. 29, W.&N.W. Sur. ..... T.D. 1,613 ft.; csg. cmtd. at 1,609 ft.
Sinclair-Prairie Oil Co.'s No. 3 Dodge, 1,650 ft. from S and 429 ft. from W, Sec. 11, Blk. 30, Twp. 1s, T.&P... S.D. 2,295 ft.

IRION COUNTY

Davis et al's No. 1 Suggs, 1,560 ft. from S and 925 ft. from W, Sec. 3,081, Blk. 28, H.&T.C. Sur. ..... S.D. 8,281 ft.; 4 bailers salt water per hour here.
Stanolind Oil & Gas Co.'s No. 1 Williams, 1,320 ft. from S and E of Sec. 1,196, T.T.R.R. Sur. ..... S.D. 6,519 ft.
Straughn et al's No. 1 Kaiser, 1,930 ft. from N and 1,390 ft. from W, Sec. 69, H. Cooper Sur. ..... S.D. 178 ft.

JONES COUNTY

Abers et al's No. 1 Burton, 150 ft. from S and 175 ft. from E of 43.4-acre tract in G. Martinez Sur. ..... S.D. 1,005 ft.; temp. abnd.
Johnson's No. 1 Huddleston, 165 ft. from S and W of N half of N half of Sec. 39, Blk. 18, T.&P. Sur. ..... Drlg. 1,110 ft.
Pope & Anderson's No. 2 Swann, 3,050 ft. from S and 1,120 ft. from E of I. Miley Sur. ..... Rig.
Smart & Reynolds' No. 1 Reynolds, 2,500 ft. from N and 150 ft. from W, Sec. 3, W. T. Scott Sur. No. 3. S.D. 175 ft.
C. S. Spelling et al's No. 1 Lillie, 200 ft. from N and W Sec. 4, E. Miller Sur. No. 2 ..... S.D. 2,030 ft.
Southern Oil Co.'s No. 1 Swann, 1,000 ft. from E and 900 ft. from S of I. Miley Sur. ..... Rig.
Transcontinental Prod. Co.'s No. 1 Rust, 5,800 ft. N and 995 ft. W of SE cor. J. J. Hughes Sur. 556 ..... Spudded.
Ungren & Frazier's No. 2 King, 465 ft. from N, 150 ft. from E, Subd. 6, M. Bueno Sur. ..... Drlg. 2,070 ft.
Young et al's No. 1 Harrell, 150 ft. from S and E of N half of Sec. 8, O.A.L. Sur. ..... Location.

LOVING COUNTY

Adams et al's No. 1 Reagan-McElvain, 2,310 ft. from NW and 1,650 ft. from NE Sec. 84, Blk. 1, W.&N.W. Sur. ..... Location.
Columbia Oil & Gas Co.'s No. 2 Wheat, 2,310 ft. from NW and 330 ft. from SW Sec. 85, Blk. 1, W.&N.W. Sur. ..... T.D. 700 ft.; running 10-in. csg.
Eppenauer Drlg. Co.'s No. 1 Victor, 2,310 ft. from NE and 330 ft. from SE Sec. 4, Blk. 2, W.&N.W. Sur. ... Fishing 2,255 ft.
Goldman et al's No. 1 Allen, 330 ft. from NE and NW of Sec. 90, Blk. 1, W.&N.W. Sur. ..... S.D. 3,308 ft.
Goldman et al's No. 2 Allen, 330 ft. from NW, 2,310 ft. from SW, Sec. 90, Blk. 1, W.&N.W. Sur. ..... Shut down.
Goldman et al's No. 1 Reagan-McElvain, 330 ft. from NE, 2,310 ft. from NW, Sec. 84, Blk. 1, W.&N.W. Sur.. Shut down.
Lewis & Siegel's No. 1 Johnson, 330 ft. from N and 1,650 ft. from W, Sec. 6, Blk. 56, Twp. 1, T.&P. Sur... S.D. 2,280 ft.
Martin et al's No. 1 Wheat, 990 ft. from SW and SE, Sec. 83, Blk. 1, W.&N.W. Sur. ..... Rig.
Miller et al's No. 1 Ferguson, 990 ft. from NE of Sec. 44, Blk. 29 ..... Spudded and S.D.
Thomas' No. 1 Wheat, 2,310 ft. from NW, 990 ft. from NE, Sec. 83, Blk. 1, W.&N.W. Sur. ..... Drlg. 3,855 ft.
Trinity Drlg. Co.'s No. 1 Wheat, 2,310 ft. from SW, 330 ft. from SE, Sec. 3, Blk. 2, W.&N.W. Sur. ..... S.D. 1,300 ft.

MENARD COUNTY

Priest's No. 1 Sorrel, 1,000 ft. from E and 200 ft. from S cor., Sec. 132, E.L.R.R. Sur. ..... S.D. 2,860 ft

PECOS COUNTY

Adams et al's No. 1 Shearer, 1,650 ft. from SE and 330 ft. from NE Sec. 101, Blk. 10 H.&G.N. Sur. ..... T.D. 1,471 ft.; 25 bbls. per day; connecting to tanks.
Cardinal Oil Co.'s No. 5-F Tippett, 300 ft. E of No. 3-F, Sec. 61, Blk. 194, G.C.&S.F. Sur. ..... Location.
Corvette Oil Corp.'s No. 5 H. Monroe, 1,040 ft. from E line and 150 ft. from N line of Sec. 39, G.C.&S.F. Sur., Blk. 194 ..... Location
Davis et al's No. 1 University, 1,650 ft. from S and 330 ft. from E, Sec. 31, Blk. 16 ..... Cellar.
Hampton et al's No. 1 Byrne, 1,980 ft. from NW and 1,500 ft. from NE, Sec. 54, Blk. 10, H.&G.N. Sur. .... S.D. 1,395 ft.; T.P. 1,856 ft.
Messinger et al's No. 1 Jones, 1,200 ft. from NW, 1,290 ft. from SW, Sec. 5, Blk. 9, H.&G.N. Sur. ..... Drlg. 250 ft.

PRESIDIO COUNTY

Sadler et al's No. 1 Bledsoe, 2,640 ft. from N and W Sec. 15, Blk. 354, G.C.&S.F. Sur. ..... S.D. 328 ft.

REAGAN COUNTY

Big Lake Oil Co.'s No. 7-C University, 1,570 ft. from W and 725 ft. from S, Sec. 25, Blk. 9 ..... T.D. 8,811 ft.; 438 bbls. in 14 hrs.; gravity 49.8 deg.
Big Lake Oil Co.'s No. 8-C University, 710 ft. from S and 2,410 ft. from E, Sec. 12, Blk. 2 ..... Drlg. 2,545 ft.
Big Lake Oil Co.'s No. 9-C University, 2,410 ft. from N and 765 ft. from E. Sec. 12, Blk. 2 ..... Drlg. 350 ft.
Big Lake Oil Co.'s No. 181 University, 1,700 ft. from S and 2,000 ft. from W, Sec. 10, Blk. 2 ..... Rigging up.
Continental Oil Co.'s No. 6-B University, 765 ft. from N and 1,980 ft. from W, Sec. 36, Blk. 9 ..... Drlg. 2,480 ft.
Group Oil Corp.'s No. 5-B University, 2,700 ft. from S and 1,775 ft. from W, Sec. 36, Blk. 9 ..... Drlg. 7,393 ft

REEVES COUNTY

F. McDorman et al's No. 1 Ray Roberts et al, 2,310 ft. from S and E lines of Sec. 22, Blk. 59, P.S.L. Sur. ... S.D. 2,018 ft.
Southern Star Oil Co.'s No. 1 Wright, 1,330 ft. from S and W, Sec. 56, Cassel's Sur. ..... S.D. 250 ft.

RUNNELS COUNTY

Blue Bonnett Oil Co.'s No. 1 McMillan, 1,368 ft. from N and 660 ft. from W, Sec. 22, N. Travis Sur. ..... T.D. 2,522 ft.; T.P. 2,520 ft.; flowing 80 bbls. daily.
Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 519 ..... S.O. 3,417-20 ft; S.D. 3,600 ft.

SCHLEICHER COUNTY

Eastland Oil Co.'s No. 1 Joe Tisdale, C Sec. 29, Blk. M, G.H.&S.A. Sur. ..... T.D. 5,410 ft.
Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,302 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... S.D. 5,580 ft.
George Wilson's No. 1 Page, Sec. 40, Blk. L, 1,290 ft. from N, 1,570 ft. from W, G.H.&S.A. Sur. ..... S.D. 5,052 ft.

SCURRY COUNTY

J. E. Dickman et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, E.&T.C. Sur. ..... S.D. 5,100 ft.
Heinzleman et al's No. 1 Hood, 436 ft. from N and 489 ft. from E, Sec. 87, Blk. 3, H.&T.C. Sur. ..... S.D. 88 ft.
Scurry County Oil Exchange's No. 1 Earnest, 2,310 ft. from N and W, Sec. 68, Blk. 3, H.&G.N. Sur. ..... Spudded and S.D.
Seifert & Dibble's No. 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of Sec. 153, Blk. 97, H.&T.C. Sur. ..... S.D. 4,992 ft.

TAYLOR COUNTY

Dunigan et al's No. 2 Hunter, 2,387 ft. from N and 3,567 ft. from E of Sec. 27, W. R. Wills Sur. No. 122.. Drlg. 2,400 ft.; T.P. 2,377 ft.; swabbing 30 bbls. day.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T. Sur. ..... S.D. 2,269 ft.
Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Georgetown Ry. Sur. ..... S.D. 3,150 ft.; moved off tools.
McPhee-Briggs' No. 1 Kern, 330 ft. from S and W Sec. 15, Blk. D-5, M.-K.-T. Sur. ..... S.D. 300 ft.
Miller Bros.' No. 1 Allison & Burke, C NW Sec. 10, Blk. 176, T.&P. Sur. ..... S.D. 120 ft.
Mid-Kansas Oil & Gas Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S, Sec. 26, Blk. 161, G.C.&S.F. Sur. S.D. 4,120 ft.

Jones et al's No. 1 Pankenham, C SE NW Sec. 42, Blk. B-2, C.C.S.D.&R.G.N.G. Sur. ..... S.D. 2,545 ft.
Sides et al's No. 1 Phelps, 2,157 ft. from N and 2,482 ft. from W, Sec. 5, G. W. Hurley Sur. ..... Drlg. 3,562 ft.

TOM GREEN COUNTY

Belding & Dutton's No. 1 Norsworthy, 1,440 ft. from S and 587 ft. from E of John McNeese Sur. ..... S.D. 760 ft.; S.O. and gas 725 ft.
Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 620 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur... SD. 1,994 ft
Pratt & Hancock's, No. 2 Lewis, 100 ft. N and 320 ft. E of most northerly SW cor. of Joshua S. Grant Sur. No. 2 ..... S.D. 300 ft.

UPTON COUNTY

Clark-Cooper's No. 1 Lane, 2,310 ft. from N and 990 ft. from E Sec. 36, Blk. 1, M.-K.-T. Sur. ..... S.D. 1,630 ft.
Hope Pet. Co.'s No. 2 Lane, 2,310 ft. from N, Sec. 36, Blk. 1, M.K.&T. Sur. ..... Drlg. 2,250 ft.; T.P. 2,200 ft.
White's No. 1 Lane, 2,310 ft. from S and 990 ft. from E Sec. 36, Blk. 1, M.-K.-T. Sur. ..... S.D. 1,330 ft.

VAL VERDE COUNTY

Couch et al's No. 1 J. P. Yoas, 1,300 ft. from the N line and E line of Sec. 31, Blk. 1 ,I.&G.N. Sur. ... S.D. 400 ft.
O. O. Owens' No. 1 Mills, Sec. 125, Blk. 1, I.&G.N. Sur., elev 2,130 ft. ..... S.D. 6,780 ft.

WARD COUNTY

Abell Bros.' No. 4 Smith, 990 ft. from SE and 285 ft. from NE of C of Sec. 4, Blk. 34, H.&T.C. Sur. ..... Location.
Atlantic Oil Prod. Co.'s No. 2 Barrow, 1,650 ft. from NE and 330 ft. from NW Sec. 23, Blk. 5, H.&T.C. Sur.... Drlg. 2,480 ft.
Barnsdall Oil Co.'s No. 2 Henry, 990 ft. from SE and 330 ft. from NE, Sec. 28, Blk. B-29, P.S.L. Sur. ..... T.D. 2,521 ft.; swabbing and flowing 190 bbls. day.
Bundy et al's No. 1 Bennett, 2,310 ft. from NW and SW Sec. 16, Blk. 34, H.&T.C. Sur. ..... Location.
Caprito et al's No. 1 Beatty, 330 ft. from SW and 990 ft. from SE, Sec. 3, Blk. 34, H.&T.C. Sur. ..... E.D. 2,310 ft.; cleaning out.
Eastland Oil Co.'s No. 2 Weiss, 1,091 ft. from SW and 2,365 ft. from SE, Sec. 4, Blk. 34, H.&T.C. Sur. ... Drlg. 2,328 ft.; T.P. 2,287 ft.
Eastland Oil Co.'s No. 1-A Weiss, 2,364 ft. from SE, 333 ft. from SW, Sec. 4, Blk. 34, H.&T.C. Sur. ..... T.D. 2,333 ft.; swabbing and cleaning out.
Eastland Oil Co.'s No. 2 Green, 2,364 ft. from NW and 330 ft. from SW, Sec. 4, Blk. 34, H.&T.C. Sur. ..... S.D. 2,290 ft.; hole full oil.
Eppenauer's No. 1 Purcell, 365 ft. from SW and 1,650 ft. from SE of Sec. 17, Blk. 14, H.&T.C. Sur. ..... **T.D. 2,740 ft.**
H. V. Greer's No. 1 Carr, 150 ft. from NW and 510 ft. from SW, Sec. 13, Blk. 5, H.&T.C. Sur. ..... **S.D. 2,223 ft.**
Gulf Production Co.'s No. 22 O'Brien, 1,100 ft. from N and 330 ft. from E, Sec. 16, Blk. F, G.M.M.B.&A. Sur. ..... Cleaning out 2,758 ft.; flowing 60 bbls. day.
Gulf Prod. Co.'s No. 13 Hutchings, 3,347 ft. from N and 330 ft. from E, Sec. 5, Blk. F ..... Location.
Kregle et al's No. 1 Heasler, 3,062 ft. from SE, 330 ft. from NE, Sec. 46, Blk. 34, H.&T.C. Sur. ..... S.D. 1,100 ft.
Landreth Prod. Co.'s No. 1 Barker, 330 ft. from NW, 437 ft. from NE, Sec. 27, Blk. B-29, P.S.L. Sur. .... S.D. 2,310 ft.; T.P. 2,305 ft.
Leidecker et al's No. 2 Bennett, 2,310 ft. from NW and 1,650 ft. from NE, Sec. 16, Blk. 34 ..... Drlg. 1,390 ft.
Maxwell's No. 1 Brillhart, 2,310 ft. from NE and SE Sec. 13, Blk. 34, H.&T.C. Sur. ..... Drlg. 1,820 ft.
R. F. Owen's No. 1 Lee, 1,344 ft. from NW and 4,532 ft. from SW, Sec. 1, J. Howe Sur. ..... Drlg. 2,110 ft.
Penn Oil Co.'s No. 1 York, 2,310 ft. from NW and SW Sec. 16, Blk. 34, H.&T.C. Sur. ..... Drlg. 2,375 ft.
Penn Oil Co.'s No. 1 Hardage-Wilson, 330 ft. from NE and SE Sec. 11, Blk. 34, H.&T.C. Sur. ..... Cellar.
Rector Oil Co.'s No. 1 Monroe, 660 ft. from NE and SE, Sec. 62, Blk. 33, H.&T.C. Sur. ..... S.D. 2,535 ft.; plugged back to straighten hole.
Renaud-Prettyman's No. 1 University, 330 ft. from N and E Sec. 4, Blk. 16 ..... Plugged back from 2,763 ft. to 2,735 ft.; pumping 60 bbls. day.
Richardson's No. 10 O'Brien, 1,897 ft. from N and 990 ft. from W Sec. 5, Blk. F ..... Drlg. 2,705 ft.
Rixford-Fuglarr's No. 1 London, 660 ft. NW, 330 ft. NE E cor. Sec. 10, Blk. 32, H.&T.C. Sur., but in Sec. 8 ..... S.D. 2,280 ft.; 400 ft. oil in hole; T.P. 2,230 ft.
Stanolind Oil & Gas Co.'s No. 2 Weiss, 330 ft. from SW and 1,310 ft. from SE, Sec. 4, Blk. 34, H.&T.C. Sur... T.D. 2,258 ft.; fishing tools.
Stanolind Oil & Gas Co.'s No. 3 Weiss, 1,118 ft. from SW and 1,310 ft. from SE Sec. 4, Blk. 34, H.&T.C. Sur. .. Drlg. 1,120 ft.
Stanolind Oil & Gas Co.'s No. 1 Grimes, 1,485 ft. from NE and 2,112 ft. from SE, Sec. 14, Blk. 34 ..... Location.
Sturm et al's No. 5 Jones, 330 ft. from SW and 990 ft. from SE, Sec. 25, Blk. B-29, P.S.L. Sur. ..... Material.
T. P. Coal & Oil Co.'s No. 5 James, 330 ft. from NE and 1,310 ft. from SE Sec. 5, Blk. 34, H.&T.C. Sur. ..... Drlg. 750 ft.
Thomas et al's No. 1 Bennett, 2,310 ft. from NE and SE Sec. 16, Blk. 34, H.&T.C. Sur ..... S.D. 2,525 ft.
Thompson's No. 1 Johnson, 2,310 ft. from SW and 330 ft. from NW, Sec. 9, Blk. 34, H.&T.C. Sur. ..... Location.
Weekly Oil Corp. and L. E. Hultz' No. 1 Burks, 330 ft. from SE and 1,320 ft. from SW, Sec. 26, Blk. B-29, P.S.L. Sur. ..... S.D. 2,900 ft.; 25,000,000 to 30,000,000 ft. gas 2,165 ft.

WINKLER COUNTY

Richardson et al's Scarborough, 990 ft. from N and W Sec. 1, Blk. 77 ..... Location.
Richardson et al's No. 1 Scarborough, 990 ft. from N and 1,650 ft. from W. Sec. 1, Blk. 77 ..... Location.
Old Richardson et al's No. 1 Scarborough, 1,650 ft. from N and W. Sec. 1, Blk. 77, P.S.L. Sur. ..... T.D. 2,875 ft.; S.D. for connections; flowed 123 bbls. in 3 hrs.
Old Richardson et al's No. 2 Sealy estate, 1,650 ft. from S and 330 ft. from W, Sec. 94, Blk. A, G.M.M.B.&A. Sur. ..... Drlg. 1,320 ft.
Richardson et al's No. 3 Scarborough, 1,980 ft. from S and 660 ft. from W, Sec. 1, Blk. 77, P.S.L. Sur. ..... Rigged up and S.D.

Wildcat Operations in Texas Panhandle

Week Ending October 3

CARSON COUNTY

Company, well, farm name, section and block—	Remarks:
H. A. M. Oil Co.'s No. 3 Cooper, 990 ft. from S. 330 ft. from W of E half NE, Sec. 5, Blk. 9, I.&G.N. Sur.	**Bldg. rig.**
Osborne's No. 1 Byrum, 330 ft. from N and E, N½ NW, Sec. 188, Blk. 3, I.&G.N. Sur.	Drlg. out plug 3,025 ft.
Sinclair Prairie Oil Co.'s No. 1 Cooper, 330 ft. from S and W. Sec. 4, Blk. 9, I.&G.N. Sur.	Location.
Stubblefield-Shell's No. 3 Cooper, 330 ft. from N and 330 ft. from E of SE, Sec. 5, Blk. 9, I.&G.N. Sur.	Cellar.
Texoma Nat. Gas Co.'s No. 1-T Urbanczyk, center SE, Sec. 25, Blk. 4, I.&G.N. Sur.	Bldg. derrick.
The Texas Co.'s No. 1 Byrum, 330 ft. from N and W, S half NW, Sec. 188, Blk. 3, I.&G.N. Sur.	Rig.

CHILDRESS COUNTY

Robertson's No. 1 Biddy, center S 26¼ acres of N, Laughlin Sur. Blk. T	**Rig.**

COLLINGSWORTH COUNTY

Cochran Bros' No. 1 Atkinson, 440 ft. from N and E Sec. 28, Blk. 31, H.&G.N. Sur.	**Spudded.**
Kates et al's No. 1 Hickman, center NE, Sec. 43, Blk. 10, H.&G.N. Sur.	S.D. 1,230 ft.; no information
Kates et al's No. 1 Bell, 200 ft. from N, 2,310 ft. from W, Sec. 21, Blk. 102, H.&G.N. Sur.	S.D. 1,250 ft.

COTTLE COUNTY

Darby Pet. Co. et al's No. 1 Puersil, 330 ft. from N, 1,320 ft. from E, Sec. 46, Blk. B, John H. Stevens Sur.	Drlg. 7 250 ft.; show gas 2,930 ft

DEAF SMITH COUNTY

Western Union Oil Co.'s No. 1 Farwell, C NW, Sec. 13-3n-2e	S.D. 1,240 ft.

GRAY COUNTY

Back & Barber's No. 1 Back, 660 ft. from S, 330 ft. from W, Sec. 140, Blk. 25, H.&G.N. Sur.	**S.D. 2,428 ft.**
Baldridge et al's No. 1 Melton, 330 ft. from NE E half NE, Sec. 95, Blk. B-2, H.&G.N. Sur.	Bldg. derrick.
Boyes et al's No. 1 Colebank-Morse, 330 ft. NE, Sec. 65, Blk. 25, H.&G.N. Sur.	S.D. 2,554 ft.; shot 50 qts.; no results.
Dixon Creek Oil Co.'s No. 1 Chapman, 330 ft. from S and W, Sec. 69, Blk. 25, H.&G.N. Sur.	Drlg. 800 ft.
Gerber O. & G. Co.'s No. 1 Stubbs, 330 ft. from S, 990 ft. from W, Sec. 9, Blk. 3, B.&B. Sur.	Cellar
Graham-Crue Hoover's No. 1 Barrett, 330 ft. from S and W, Sec. 130, Blk. 3, I.&G.N. Sur.	Drlg. 2,020 ft.
Jewel Oil Co.'s No. 1 Meera, 330 ft. from S and W. NW SW, Sec. 106, Blk. 3, I.&G.N. Sur.	**S.D. 2,483 ft.**
Kewanee O. & G. Co.'s No. 1-F Morse, 330 ft. from S and W, Sec. 3, Blk. 26	Drlg. 2,525 ft.; show gas 2,350 ft
Magnolia Pet. Co.'s No. 6 fee, 660 ft. from S and W, Sec. 14, Blk. 3, I.&G.N. Sur.	Standardizing 2,778 ft.
Nipper et al's No. 1 Morse, 330 ft. from N and E, Sec. 1, Blk. 26, I.&G.N. Sur.	S.D. 2,750 ft.
Nabob Oil Co.'s No. 1-E Morse, 330 ft. from S and W, W½ SE, Sec. 67, Blk. 25, H.&G.N. Sur.	S.D. 3,000 ft.; to test.
Parton & Holt's No. 2 Morse, 330 ft. from W, 250 ft. from N, W½ SW, Sec. 5, Blk. 26, H.&G.N. Sur.	Drlg. 2,645 ft.
Parton Holt's No. 3 Morse, 660 ft. from N and E of E half SW, Sec. 5, Blk. 26, H.&G.N. Sur.	Drlg. 1,825 ft.
Plains Drlg. Co.'s No. 1 Thut, 960 ft. from N, 330 ft. from W, Thut Sur.	Testing 2,875 ft.; swabbed 60 bbls. in 24 hrs.
Pulse-Shell's No. 1 Brown, 290 ft. from N, 250 ft. from E of NW, Sec. 128, Blk. 3, I.&G.N. Sur.	S.D. 1,970 ft.
Richardson's No. 1 Wright, 330 ft. from S and W, Sec. 12, Blk. 3, I.&G.N. Sur.	Drlg. 2,700 ft.
Saunders et al's No. 2 Sullivan, 832 ft. from W, 231 ft. from NE, 160 ft. S, 264 ac. of N½, Sec. 136, Blk. 3, I.&G.N. Sur.	**Will plug back to 3,375 ft. and shoot.**
Skelly Oil Co.'s No. 3 South Jackson, 330 ft. from N, 990 ft. from E, Sec. 88, Blk. B-2	Rigging up rotary.
Skelly Oil Co.'s No. 6 Saunders, 270 ft. from S, 330 ft. E SW, Sec. 4, Blk. 1, A.C.H.&B. Sur.	Drlg. 2,110 ft.
Skelly Oil Co.'s No. 7 Saunders, 330 ft. from N, 360 ft. from W, Sec. 4, Blk. 1, A.C.H.&B. Sur.	Moving in rig.
Tarber's No. 1 Saunders, 330 ft. N and W, Sec. 3, Blk. 1 B.B.&S.F. Sur.	Location
The Texas Co.'s No. 5 Shaw, 330 ft. from S and E, E half, Sec. 5, Blk. 1, A.C.H.&B. Sur.	Moving in rig.
The Texas Co.'s No. 10 Cook-Faulkner, 330 ft. from S, 1,605 ft. from W. Sec. 29, Blk B-2, H.&G.N. Sur.	Drlg. 2,935 ft.; 300 ft. oil in hole.
The Texas Co.'s No. 1 Pope, 330 ft. from N and E of W half SE, Sec. 173, Blk. 3, I.&G.N. Sur.	Drlg. 1,720 ft.
The Texas Co.'s No. 12 Williams, 270 ft. from N, 330 ft. from E of N half NW, Sec. 7, Blk. 1, A.C.H.&B. Sur.	Drlg. 2,175 ft.
Tripplehorn Bros.' No. 1 Lovett, 330 ft. from N and W, Sec. 57, Blk. B-2, H.&G.N. Sur.	Drlg. 2,900 ft.
Travis et al's No. 2-B Webb, 990 ft. from S, 330 ft. from E of NW, Sec. 61, Blk. 25, H.&G.N. Sur.	Drlg. 2,125 ft.
Weltzel Oil Co.'s No. 2 Morse, 330 ft. from S and E of N half NW, Sec. 47, Blk. 25, A.&G.N Sur.	Drlg. 1,703 ft.

HEMPHILL COUNTY

Hoover's No. 1 Hoover, 350 ft. from N, 1,200 ft. from E, G. S. Hood Sur.	**S.D. 5,100 ft.**

HUTCHINSON COUNTY

Baso's No. 1 Moore, 330 ft. from S, 330 ft. from E, in 80 ac. in NW, Sec. 21, Blk. M-21, T.C.R.R. Sur.	T.D. 3,080 ft.; estm. 5 or 10 bbls. may plug.
Canadian River Gas Co.'s No. 2-A Dunaway, 330 ft. from N and W, SE, Sec. 5, Blk. Y-2, T.T.R.R. Sur.	Drlg. 2,035 ft.; show gas 1,692 ft.
Danciger O & R. Co.'s No. 1 Johnson, 330 ft. N and W, SE, Sec. 34, Blk. Y, A.&B. Sur.	Spudded and S.D
Deal O. & G. Co.'s No. 2 Sanford, 330 ft. N and E of N 80 ac., S 160 ac., Sec. 81, Blk. 46, H.&T.C. Sur.	**S.D. 450 ft.**
Holmes & Newblock's No. 2 Moore-Langdon, 330 ft. from N and W, Sec. 125, Blk. 4, I.&G.N. Sur.	**S.D. for repairs 2,947 ft.**
Huber Pet. Co.'s No. 2 Christian, 330 ft. from S and E, SW, Sec. 33, Blk. Y, A.&B. Sur.	Drlg. 909 ft.
Huber Pet. Co.'s No. 1 Moyer-Johnson, 990 ft. from N, 330 ft. from E half SW, Sec. 34, Blk. Y, A.&B. Sur.	T.D. 2,190 ft.; pulling big pipe.
Liner Drlg. Co.'s No. 1-D Johnson, 330 ft. from N and E Sec. 6, Blk. 1 B.&B. Sur.	**Plugged back to 2,146 ft.; S.D**
Joe Murphy's No. 1 Watkins, 440 ft. from N and W of N half, Sec. 13, Blk. M-21	Rig.
Oates & Morrow's No. 2 Starnes, 1,400 ft. from S, 680 ft. from E. Sec. 24, Blk. M-23, T.C.R.R. Sur.	S.D. 3,000 ft.
Pharis Oil Co.'s No. 5 Smith, 660 ft. from N and W, SW, Sec. 14, Blk. Y M.&C. Sur.	Shut down.
Stansylvania Oil Co.'s No. 3 Stansbury, 336 ft. from S, 1,264 ft. from W, Sec. 129, Blk. Z, E.L.&R.R. Sur.	Drlg. 2,330 ft.
Timms-Deatch's No. 4 Moore, 330 ft. N and W, Sec. 124, Blk. 4, I.&G.N. Sur.	Drlg. 2,305 ft.

LIPSCOMB COUNTY

Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur.	**T.D. 5,003 ft.**

MOORE COUNTY

Dogie Oil Co.'s No. 1 Greenwald, 330 ft. from N and W, Sec. 277, Blk. 44, H.&T.C. Sur.	Rebuilding rig 1,150 ft.
Shamrock Oil & Gas Co.'s No. 2 Brumley, 330 ft. from N and W, Sec. 360, Blk. 44, H.&T.C. Sur.	Standardizing 2,772 ft.
Shamrock Oil & Gas Co.'s No. 1 Burnett, 660 ft. from S, 330 ft. from W, Sec. 359, Blk. 44, H.&T.C. Sur.	T.D. 2,984 ft.; to drill by pipe.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE, Sec. 10, Blk. G, B.&B. Sur.	**S.D. 530 ft.**

OLDHAM COUNTY

Amalgamated German-American Oil Corp.'s No. 1 Norton, 330 ft. S and E, Sec. 13, T.&N.O. Sur.	**S.D. 400 ft.**
Chambers et al's No. 1 Herring, CNL, Sec. 20, Blk. S, G.C.&S.F. Sur.	T.D. 4,000 ft.; fishing pipe.

ROBERTS COUNTY

Chicken Creek Oil Co.'s No. 1 Ledrick, 330 ft. N and W, Sec. 55, Blk. C, G.&M. Sur.	Underreaming 6-in. csg. 4,552 ft.
Travis et al's No. 1 Cunningham, 330 ft. S and W, Sec. 74, Blk. M-2, H.&G.N. Sur.	**S.D. 2,690 ft.**

WHEELER COUNTY

Delaney et al's No. 1 Sitter, 330 ft. from S and W of E half NE, Sec. 33, Blk. 24	Bldg. derrick.
Devore & Robinson's No. 1 Sitter, 2,310 ft. from S and E, E½, Sec. 33, Blk. 24, H.&G.N. Sur.	T.D. 2,760 ft.; S.D. for pipe line connection.
Elbar Corp.'s No. 1 Huselby, 1,856 ft. from N, 350 ft. from W, Sec. 70, Blk. 24, H.&G.N. Sur.	Drlg. 2,035 ft.; carrying 8-in. csg
Piney Oil & Gas Co.'s No. 4 Thompson, 330 ft. from S and E of E half SW, Sec. 42, Blk. 24, H.&G.N. Sur.	Drlg. 2,083 ft.

Noble County Wildcat Produced 1,817 Bbls. in First 24 Hours From Second Wilcox Sand

By W. A. SPINNEY
Staff Correspondent, Oklahoma Fields

L. H. Wentz and others' No. 1 Wolff, C SE NW, Section 17-20-2w, Noble County, community wildcat test, appears to have justified the confidence of the operators in drilling this well, as it gauged 1,817 bbls. of 42 gravity oil the first 24 hours and 411 bbls. the next five hours, making a total of 2,228 bbls. of oil before being shut in. The large flow of oil was found in the second Wilcox sand at 5,193-96 feet. The well is expected to take a 10-day potential gauge as soon as a pipe line connection is secured.

The well is located on a 2,160-acre unit block with the following companies interested in the block: Shell Petroleum Corp., Gypsy Oil Co., Sinclair Prairie Oil Co., L. H. Wentz, Twin State Oil Co., Carter Oil Co., Phillips Petroleum Co. and Empire Oil & Refining Co. The area outside of the block has been the most recent lease and royalty play and many predict it will be the next major oil play.

Particular significance is attached to the well as it is the most important wildcat completed in the State since the Oklahoma City Field was found about four years ago. The well opens an area that heretofore was devoid of deep exploration.

The well was averaging 76 bbls. an hour when shut in and the gas flow was averaging around 2,500,000 feet a day. The first Wilcox sand was found at 5,125-78 feet. It was a hard sand carrying only a small showing of oil. Because of the hardness of the second Wilcox sand it is believed the well is unable to drill itself in and when a pipe line connection is secured it may be drilled a few feet deeper into the sand.

Log of New Well

Following is a copy of the log on Wentz and others' No. 1 Wolff (community test), C SE NW, Section 17-20-2w, Noble County:

Feet	Formation—	Feet	Formation—
40	Clay	3,090	Lime
44	Lime	3,098	Lime and shale
55	Brown lime	3,114	Shale
70	Brk. sand	3,117	Lime
90	Water sand	3,126	Shale
110	Red bed	3,145	Sandy shale
136	Sandy, 15½ csg.	3,160	Sand
160	Sand	3,180	Sand and shale
205	Clay and sand	3,202	Shale
593	Brk. sand and shale	3,235	Shale and shells
		3,255	Lime
680	Sand and shale	3,270	Sand and shale
700	Lime	3,284	Shale
765	Red bed, sand	3,293	Lime
800	Sand and shale	3,304	Shale
860	Shale	3,335	Shale
885	Lime	3,392	Shale and shells
1,000	Shale	3,428	Sand and shale
1,052	Sandy lime	3,438	Shale
1,080	Shale	3,445	Sand and shale
1,085	Lime	3,451	Dark sand
1,195	Shale	3,466	Sand
1,205	Shale	3,481	Shale
1,225	Lime	3,487	Sand and shale
1,260	Lime and shale	3,505	Shale
1,310	Shale	3,543	Sand and shale
1,345	Sand	3,554	Shale
1,525	Lime shale	3,560	Sand
1,540	Lime	3,581	Shale
1,590	Broken lime	3,652	Shale
1,615	Lime	3,675	Lime
1,620	Shale	3,690	Shale
1,675	Sandy lime	3,705	Lime and shale
1,785	Lime and shale	3,722	Lime
1,860	Sandy lime	3,767	Lime and shale
1,890	Shale	3,778	Shale
1,893	Sandy shale	3,805	Shale
1,930	Shale	3,808	Sandy lime
1,940	Lime	3,816	Sand (cored)
1,955	Shale	3,898	Blue shale
2,035	Shale and lime	3,935	Sand and lime
2,042	Sand	3,956	Shale and shells
2,070	Shale	3,959	Sand
2,150	Br. lime, shale	3,972	Sandy shale
2,170	Shale	3,990	Sand (cored)
2,180	Shale and lime	4,010	Sand (cored)
2,200	Shale	4,037	Sand and shale
2,227	Lime	4,165	Sand and shale
2,235	Sandy lime	4,182	Red rock
2,240	Sandy lime	4,190	Sand
2,320	Shale	4,195	Shale
2,324	Shale and lime	4,230	Shale blue
2,338	Sand	4,235	Sandy lime
2,385	Lime	4,248	Sandy lime
2,395	Br. lime	4,284	Shale
2,405	Shale	4,290	Lime and shale
2,420	Lime	4,314	Shale
2,430	Sandy lime	4,340	Shale and shells
2,452	Sandy lime and shale	4,375	Shale and sand
		4,385	Shale
2,458	Sand	4,390	Sand
2,478	Sandy lime	4,405	Sandy shale
2,482	Sandy lime, br.	4,422	Sandy lime
2,487	Shale	4,434	Shale
2,495	Sandy lime	4,450	Hard shale
2,515	Lime shale	4,480	Shale and sand
2,520	Shale	4,500	Shale
2,542	Sand	4,520	Shale
2,545	Br. sand	4,540	Lime (Oswego)
2,550	Sand and shale	4,544	Br. lime, shale
2,560	Shale	4,565	Lime and shale
2,570	Br. lime	4,570	Blue shale
2,575	Shale	4,585	Lime and shale
2,583	Shale	4,608	Lime and shale
2,588	Sand	4,630	Lime and shale
2,610	Sand and shale	4,643	Shale and lime shells
2,625	Shale		
2,630	Sand		
2,640	Sand and shale	4,665	Lime
2,650	Hd. lime	4,678	Br. lime
2,667	Shale	4,694	Br. lime
2,677	Shale	4,706	Br. lime, shale
2,688	Lime	4,710	Shale
2,708	Sandy shale	4,722	Lime
2,711	Sand	4,729	Lime and shale
2,725	Br. sand	4,740	Lime
2,735	Br. sand	4,753	Lime and shale
2,737	Shale	4,778	Lime and shale
2,750	Sand	4,783	Lime
2,770	Sand	4,796	Shale and lime
2,775	Hard sand	4,820	Lime and shale
2,790	Blue shale	4,830	Br. lime
2,808	Shale and sand	4,853	Shale
2,814	Red rock	4,868	Shale
2,828	Sand	4,874	Lime
2,877	Shale, red rock	4,909	Shale
2,884	Red rock	4,937	Shale
2,890	Sand	4,947	Sandy shale
2,900	Hard sand	4,949	Lime
2,911	Sand, shale	4,966	Sand and shale
2,913	Soft sand	4,980	Shale
2,928	Sand	5,000	Shale
2,932	Hard sand	5,009	Shale
2,940	Shale	5,012	Clay
2,988	Shale and lime	5,014	Lime and shale
2,990	Lime	5,027	Lime
2,998	Sand and shale	5,065	Lime
3,002	Lime	5,077	Lime, 8-in. csg.
3,034	Sandy shale	5,125	Sandy dolomite
3,038	Shale	5,168	Sand
3,050	Lime	5,182	Hard sand
3,058	Red rock	5,188	Green shale
3,065	Lime and shale	5,193	Sand
3,080	Shale	5,197	Sand, T.D.

Commission Hearings

The testimony on the 25-bbl. allowable and the 100-bbl. allowable for wells making 3 per cent or more water granted in Oklahoma City, was concluded Friday, September 30, before the State Corporation Commission. Arguments will be heard later and it is hoped a decision will be handed down before the October allowables are taken. The question before the commission is whether the 25-bbl. allowable for all wells and the water exemptions will be continued. The taking of testimony required eight days.

The State's daily average production for the week ending October 1 was estimated at 385,950 bbls. which is a decline of approximately 4,000 bbls. per day from the previous week's gauges.

During the week the military found that one of the wells in the Oklahoma City Field, that was supposed to be shut in, was flowing oil. The well was Marshall Oil Co.'s No. 1 Butcher, and it is estimated to have made 26,000 bbls. of oil in approximately 44 hours while open. The well was again shut in by the militia and it was found that a 2-inch steel bar, 25 feet long, was suspended through all the connections preventing the shutting of gate valves on the well. The well on this property was previously shut in about two months ago by an order of the Corporation Commission.

Work on a community wildcat well was started during the week northwest of Oklahoma City, in Oklahoma County. Carter Oil Co., Gypsy Oil Co. and Sinclair Prairie Oil Co.'s No. 1 Shawbell, C SW NE Section 1-12-4w, is on a community block of approximately 1,800 acres. This well is expected to be a deep Wilcox sand test and it may aid in proving the trend of the buried Nemaha Mountain range, south from the Mid-Kansas Oil & Gas Co.'s No. 1 Messer, in Section 32-14-3w, and the Oklahoma City Field. No. 1 Messer has been shut in for two years. It is a Wilcox sand oil well estimated at 250 bbls. initial production.

It is believed that more wildcat tests would be drilling in the State if landowners would include their farms in unit operations. The action of landowners in refusing to join in community operations unless paid a large bonus has delayed the starting of two wells west and northwest of Kaw City, in eastern Kay County. Companies are attempting to unitize these blocks for separate tests.

One is in the vicinity of a test that was drilled several years ago. The block is in Sections 16, 17, 20 and 21-27-4. The first well was drilling in Section 21-27-4, and had several showings of oil. The other wildcat is reported to be in the area about 7 miles west of Kaw City.

The English Drilling Co.'s No. 1 Heenan-Coe, NE cor. SE NE Section 32-3-7w, Grady County, is estimated to be good for 100 bbls. daily from a sand series at 3,255-87 feet.

South and west of Wentz and others' No. 1 Wolff, new wildcat oil well in Noble County is the Eason Oil Co.'s No. 1 Cotcha, in Logan County, which is a producing well, completed more than a year ago. On south of No. 1 Cotcha is the Ramsey Petroleum Co.'s No. 1 Duck Club, in Section 10-16-4w, Logan County, which is drilling and is expected to reach markers in the next week.

In Cleveland County there are a couple of short-time blocks in the northern part of the county, where some activity may be expected to start. One of the blocks is in Township 10-2w and the other in Township 9-1w.

Holdenville Seeks Oil Outlet

Operators in the west Holdenville area, Hughes County, are preparing to present a petition to the statewide proration committee and to Umpire Ray M. Collins, in order to secure an outlet for the crude oil from the field.

The Tulsa Petroleum Co. is constructing a small pipe line from the shallow wells in the area to a loading rack in Holdenville, but this pipe line will not handle any of the oil from the deeper wells. The Mid-Continent Petroleum Corp. has several producing wells in the deep sand and these are all shut in. This company may extend its pipe line system from the Seminole area to serve the field but nothing definite has been announced.

The field is one of the active areas in the State outside of the Oklahoma City area and is regarded as having a promising future. New operations include the Sovereign Oil Co.'s No. 1 Scott, NW cor. SW SW, Section 10-7-8; Fleetborn Oil Co.'s No. 2, NW cor. SW, Section 14-7-8; and Mid-Continent Petroleum Corp.'s No. 1, SE cor. NE, Section 9-7-8.

Active operations in the area are Limestone Oil & Gas Co.'s No. 3 Walker, drilling at 900 feet; Pringle and Marshall's No. 1 Church, SW cor., Section 10-7-8, rigging up; same company's No. 1 Edwards, cleaning out preparing to test the Calvin pay; Keyokla Oil Co.'s No. 1 Davis, SW cor. NE NW, Section 14-7-8, drilling at 500 feet; No. 2 Davis, SE cor. NW, Section 14-7-8, an old gas well at a total depth of 988 feet, being cleaned out to drill deeper to the Calvin sand; Galbreath and others' No. 1 Narcomey, SW cor. NW, Section 14-7-8, in the Calvin sand at 1,180-1,225 feet, with a showing of oil and landing casing to test; Southern Oil Co.'s No. 1 Foster, NW cor. SE SW, Section 14-7-8, drilling at 800 feet.

Manahan Drilling Co.'s No. 1 Narcomey, NE cor. SW SW, Section 10-7-8, cored a showing of oil at 2,898-2,919 feet, and was preparing to make a production test. Milam & Capshaw's No. 1 Holmes, SE cor. SW SW, Section 11-7-8, was rigging up to drill deeper after finding a showing of oil in the Calvin sand at 1,200 feet.

Wants Reports on Gas

During the week companies owning gasoline plants in the Oklahoma City Field were ordered by the Corporation Commission to immediately compile reports on all gas handled by them, whether from their own wells, or by purchase, as the first step toward curbing the alleged gas wastage in the Oklahoma City Field.

It is believed the commission intends to issue an order making it necessary for companies to make regular reports on gas production to the commission. The information requested will include gas volume, dates, leases, well numbers and farm names since the opening of the field almost four years ago. Where gas is handled from leases and not metered at individual wells, the lease production report will be accepted.

The question arose when the commission asked if any of the companies having representatives at the meeting could furnish the commission with the quantity of gas handled at their plants from Oils, Inc.'s No. 1 Ross during the period the well is alleged to have been overproduced. The Phillips Petroleum Co., Indian Territory Illuminating Oil Co. and Wirt Franklin Petroleum Corp. attorneys said that reports could be obtained immediately.

Most of the discussion about the gas wastage in the Oklahoma City Field came after witnesses had testified on the 25-bbl. allowables and the water allowables. This hearing has been under way for about three weeks and it may require several days more before all the evidence is in.

It has been intimated that the decision of the commission will be tested in the State Supreme Court when it is given. Appeals will be based on the legal technicalities as well as testimony presented by technical witnesses.

M. J. Kirwan, vice president of the Indian Territory Illuminating Oil Co., in charge of production, testified that there are 325 wells in the Oklahoma City Field with an allowable of 50 bbls. a day or less that have an estimated ultimate recovery of 77,991,000 bbls. of oil. These wells have been credited with a combined adjusted potential of 350,187 bbls. per day. Unless they are given an exemption they will not recover their entire potential, the witness said. Mr. Kirwan was asked how the wells should be produced to get their maximum recovery on an allowable of .05 per cent of their potential, and he replied that back pressure was the most efficient means.

One of the witnesses said that after making a survey of 62 wells producing from the Simpson sand formation it had

been found that the operating cost of wells required an allowable of 26 bbls. daily to pay overhead. He said that unless the wells were permitted to produce that much oil they probably would be abandoned before much of the recoverable oil had been produced.

An engineer with the Anderson & Prichard Oil Corp. testified that the company could have produced 406,768 bbls. of oil more than it did during the period from November 1, 1931, to September 1, 1932, had there been no privileges granted to wells in the field.

On any well, up to 15 per cent allowable, back pressure should be applied, the witness said, in order not to waste the gas or reservoir energy. The witness further testified that there are 105 wells in the Oklahoma City Field, which, if exemptions were removed, would average less than 5 bbls. per day. These wells would have to be abandoned with much of their ultimate recovery lost, should the allowables be removed.

Wilcox-Simpson Survey

W. S. Morris, engineer in charge of proration with the Indian Territory Illuminating Oil Co., testified that he made a survey of all wells producing from the Wilcox sand and the Simpson below the Wilcox sands, during the period from November 1, 1931, and September 1, 1932. The Wilcox sand wells produced 22,767,905 bbls. or at the rate of 8,835 bbls. per acre, while the Simpson sand wells had recovered 10,256,825 bbls., or at the rate of 2,560 bbls. per acre, during the period.

The witness was unable to give figures on the potentials of these wells by groups and said that he did not have the total recovery of the wells from date of completion. He was ordered by the commission to bring into the court a list showing these wells included in the two compilations.

Engineers' Report

The engineers' report and recommendations for proration in the Oklahoma City Field, which was presented to the commission last March by Ray M. Collins, was again referred to as a solution of the problem of the allowables for all the wells and the water allowables.

This report recommended that wells making 3 per cent or more water would be granted a percentage increase in flow based on the outlet of the field. Small wells, referred to as minimum wells, would likewise be given a percentage increase in allowable and these two classes of wells would be exempt from taking potentials and would not be granted a percentage allowable in addition to the original percentage amount.

This would permit classification of each individual well. One of the witnesses expressed the opinion that the 25-bbl. allowable to all wells in the field is a violation of the principle of proration, and not in the interest of conservation, except where it was extended to small wells so they could be operated economically and permit full recovery.

Oils, Inc., Fined

The Oklahoma Corporation Commission assessed a fine of $14,200 against Oils, Inc., on multiple charges of having violated the proration rules and regulations by overproducing its No. 1 Ross in the Oklahoma City Field. The well is alleged to have produced approximately 709,000 bbls. of oil during the period from March 13 to August 5, 1931, and that during that time no reports were made to the commission or the umpire's staff. The fine was based on $200 a day instead of $500 per day, which is the maximum allowed, and it is the largest total fine assessed against an alleged violator of the proration rules to date.

Last week the Corporation Commission refused to permit the owners of this well to take a potential gauge or to make up the underage on the basis of the well's initial flow. Some time ago tests showed the well to be good for an estimated 100,000 bbls. a day on a potential gauge.

Atoka County

Barker and others' No. 2 Miller, NE cor. NW SE SW Section 26-1-14, is a rig. Malarnee and others' No. 2 D. O. K. Land, C SE SE Section 35-2s-13, is a rig. Harrell and others' No. 1 Newman, NW cor. NE SW Section 5-1s-14, was drilling at 500 feet. Bufford and others' No. 1 Cook, NE cor. SW Section 9-1s-14, is spudding.

Carter County

B. J. Lundy and others' No. 1 Majors, NE cor. SE SE Section 25-1s-3w, is a location. Schermerhorn-Ardmore Oil Co.'s No. 12 Watkins, SE cor. NW SE Section 24-4s-3w, was drilling at 500 feet. Same company's No. 11 Wilson, NW cor. SW NE NE Section 23-4s-3w, made 10 bbls. from 1,080-1,135 feet.

Coal County

Radical Oil Co.'s No. 1 Richardson, NE cor. NW Section 2-1s-8, was abandoned at 1,600 feet.

Comanche County

Ashcraft & Palmer's No. 1 Collier, SW cor. NW SW Section 28-2-10w, made 3 bbls. from 420-38 feet, total depth 1,908 feet.

Creek County

Tulsa Oil Co.'s No. 3 Purcell, CEL NW NE Section 22-19-9, is a rig. A. A. Bailey's No. 1 Scott, NW cor. NE NW Section 32-19-9, is a rig on the ground. L. B. Jackson and others' No. 1 Hall, SE cor. NE NE Section 26-18-8, is a rig. Big Four Oil Co.'s No. 1 Thompson, SE cor. SW NE Section 32-19-9, was spudding. Merritt and others' No. 4 Brown, SE cor. NE NW Section 27-18-8, was drilling at 400 feet. Jackson & Wise's No. 1 Grayson, NE cor. SE SE Section 20-18-9, old well drilling deeper, was drilling at 2,920 feet. O. M. Ireland and others' No. 2 Bible, SE cor. NW SW Section 20-19-9, made 15 bbls. from 2,358-77 feet. Gled Oil Co.'s No. 1 Rentie, SW cor. NE SE Section 32-19-9, made 3,500,000 feet of gas from 2,365-71 feet. Carpenter & Dowd's No. 1 Buster, C SW NE Section 24-18-10, made 2 bbls. from 759-73 feet. Smith & Williams' No. 1 Tiger, NE cor. SE SE Section 28-16-9, made 20 bbls. from 2,585-99 feet.

Marshall County

Peacock and others' No. 1 Flynn, NW cor. SW SE Section 3-7s-6, was drilling at 100 feet.

Muskogee County

Pine's No. 2 Burnett, SW cor. NW Section 34-16-15, made 750,000 feet of gas from 1,081-1,112 feet. Western Drilling Co.'s No. 2 Murrell, CEL SE SE Section 4-15-8, made 27 bbls. from 988-1,008 feet. Finefield's No. 2 Murrell, CEL SE SE Section 5-15-18, was abandoned at 1,060 feet.

Oklahoma County

Coline Oil Co.'s No. 1 Warren, SW cor. Section 18-11-2w, old well plugged back, total depth 6,516 feet, plugged back to 5,207-5,410 feet, 10,000,000 feet of gas completed. Phillips Petroleum Co.'s No. 1 Ingle, CSL SW NE Section 3-11-3w, made 12,763 bbls. in four hours from 6,281-6,405 feet. J. E. Shaffer and others' No. 2 McKee, C NE NW Section 3-11-3w, made 7,760 bbls. in four hours from 6,315-6,480 feet. R. Day and others' No. 1 Leveresh, C NW SE Section 22-11-3w, made 3,610 bbls. from 6,463-6,580 feet.

Okmulgee County

Rorabaugh and others' No. 1 Grayson, CEL SW NE Section 35-15-14, is a rig. Wallace and others' No. 8 Colbert, SE cor. NW NW Section 14-14-14, is a machine. J. E. Selby and others' No. 35 Anderson, SE cor. NW NW Section 35-14-14, was drilling at 500 feet. J. H. Rebold and others' No. 1 Carter, SE cor. SW SW Section 15-13-12, was abandoned at 2,944 feet. Mid-Western Oil & Gas Co.'s No. 1 Grayson, SE SW NE Section 5-13-14, was abandoned at 2,582 feet. Castleman's No. 7 Thomas, 23-14-14, was abandoned at 2,582 feet. Castleman's No. 7 Thomas, Section 23-14-14, was abandoned at 1,135 feet.

Okfuskee County

J. L. Selby's No. 1 Riter, NE cor. NW Section 9-12-11, is rigging.

Osage County

Appleman and others' No. 21, SE cor. NE SE Section 16-22-9, is a machine.

Pawnee County

Pueblo Oil Co.'s No. 4, SW cor. NE NW Section 14-21-8, is spudding.

Pottawatomie County

Brackett's No. 1 Pearson, NE cor. SW NE Section 9-7-4, is a rig. Royce and others' No. 1 Walker, NE cor. SE NW Section 22-7-5, is a machine. Spears and others' No. 1 James, SE cor. NE Section 2-6-3, is a rig. Gypsy Oil Co.'s No. 1 Masters, SW cor. NE Section 25-6-4, made 412 bbls. from 3,372-3,513 feet. Mid-Continent Petroleum Corp.'s No. 1 Schrader, NW cor. NE Section 6-6-5, made 160 bbls. from 2,833-52 feet.

Pontotoc County

Benedum & Trees' No. 3 Mallory, NE cor. SW SW Section 30-5-5, is digging cellar. Lake Oil Co.'s No. 2 Mallory, SW cor. NW SW Section 30-5-5, is digging cellar. Superior Oil Co.'s No. 4 Boyd, SE cor. NE NW Section 32-5-5, made 120 bbls. from 2,523-44 feet.

Seminole County

Producers & Refiners Corp.'s No. 2 Jefferson, NW cor. SE Section 19-9-6, made 25 bbls. from 4,154-56 feet. Carter Oil Co.'s No. 7 Campbell, NE cor. SW Section 20-9-6, made 487 bbls. from 2,749-90 feet. Patrick Drilling Co.'s No. 1 Earl, NE cor. SE NW Section 32-9-6, was abandoned at 2,771 feet.

Stephens County

L. Sykes' No. 3 Broadbent, CNL SE NW Section 16-1s-8w, is a rig. G. Pace and others' No. 2 Brush, NE cor. SW SW SE Section 1-2s-8w, is a rig. Same operator's No. 2 Enlow, NW cor. SW SE Section 21-2s7w, is a rig. California Production Co.'s No. 1 Sutton, NE cor. SE SW Section 12-3s-6w, is a location. Same company's No. 1 Garnett, SE cor. NE SE Section 11-3s-6w, was drilling at 200 feet. Pace and others' No. 2 Butler, SW cor. SE NW SE Section 35-2s-7w, was abandoned at 1,955 feet.

Wagoner County

Lambert & King's No. 1 McIntosh, NE cor. SE Section 22-18-15, was drilling at 500 feet. Edwards' No. 1 Trotter, SW cor. SE Section 15-18-15, made 25 bbls. from 986-98 feet.

Wildcat Operations in Oklahoma

Northern Oklahoma

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	S.D. 1,232 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w	S.D. 5,502 ft.

ATOKA COUNTY

Borton et al's No. 1 Miller, NE SW SW Sec. 26-1-14	Abd. 525 ft.
Hick's No. 2 Morris, SE NE NW SE Sec. 5-1-15	Drlg. 185 ft.
George's No. 1 Reddin, SW NE SW Sec. 19-1-15	Drlg. 100 ft.
Winham et al's No. 1 Redwine, SE SW SW Sec. 23-1-14	Abd. 135 ft.

BECKHAM COUNTY

Pattel Royalty's No. 1 Goose Tree, SW SE SW SE Sec. 32-10-23w	S.D. 924 ft.
Mid-Texas Co.'s No. 1 Sidell, NE cor. SW SW Sec. 17-22-22w	S.D. 2,550 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	S.D. 3,575 ft.

BLAINE COUNTY

Watonga Petroleum Co.'s No. 1 Masters, SW NW NW, Sec. 27-16-11w	S.D. 672 ft.

CADDO COUNTY

Abernathy & Brown's No. 2 Houston, Sec. 24-6-13w	S.D. 1,115 ft.

CHEROKEE COUNTY

La Piere et al's No. 1 Woods, C SE SE Sec. 27-17-21	S.D. 1,504 ft.

COAL COUNTY

Dodd & Burton's No. 1 Grigsby, NW SE NE, Sec. 35-1-8.	Location.
Funk & Russell's No. 1 Miller, SE NE Sec. 10-2-8	Drlg. 2,600 ft.
Radial Oil Co.'s No. 1 McGraw, NE NW Sec. 2-1s-8	Drlg. 1,570 ft.

COMANCHE COUNTY

G. W. Stogner's No. 1 Doebel, C SW SW Sec. 3-3-9w	S.D. 1,450 ft.

CREEK COUNTY

O. O. Owens' No. 1 fee, NW cor. Sec. 23-15-7	Rig.
E. L. Jillson et al's No. 1 Starr, SE NW Sec. 13-15-8	Drlg. 3,380 ft.

CUSTER COUNTY

Miley Pet. Co.'s No. 1 Caldwell, NE Sec. 12-14-14w	Location.

ELLIS COUNTY

Algers Pet. Co.'s No. 1 Roper, C SE NW Sec. 21-20-24w	S.D. 50 ft.

GRADY COUNTY

English Drlg. Co.'s No. 1 Heenan-Coe, NE SE NE, Sec. 33-3-7w	Show oil 3,255-87 ft.; to test drlg. out cmt.; swbd. 3 bbls. per hr.

GARFIELD COUNTY

E. L. Love et al's No. 1 White, SE cor. NW Sec. 9-24-6w	S.D. 5,850 ft.

GREER COUNTY

French's No. 1 Murphy, SW NW Sec. 23-7-21w	S.D. 1,645 ft.

HASKELL COUNTY

Ault et al's No. 1 Hall, NW SW SW Sec. 14-9-19	S.D. 2,000 ft.
Ault et al's No. 1 Hall, SE NW Sec. 25-19-9	S.D. 200 ft.

KAY COUNTY

Bluebaugh et al's No. 1 Indian, C NW NE Sec. 30-25-1	T.D. 2,607 ft; P.B. to 2,569 ft.
Lewis et al's No. 1 Harris, SE NW Sec. 14-25-1	Location.
Mummert Drlg. Co. et al's No. 1 Cormick, C NW SE Sec. 9-27-2	S.D. 3,693 ft.
Blackwell Oil Co.'s No. 1 Harshman, Sec. 2-26-1w	Rig on ground.

KIOWA COUNTY

McWhirter Bros.' No. 1 Kline, SE NW, Sec. 5-6-16w	S.D. 830 ft.
Christian's No. 1 Jones, NE SE Sec. 8-7-18w	S.D. 1,610 ft.

LATIMER COUNTY

P. English's No. 1 Unknown, NW SE Sec. 16-6-19	Abd. 1,542 ft.

LINCOLN COUNTY

Sovereign Oil Co.'s No. 1 Flowers, SW SE SE Sec. 14-12-3.	Drlg. 3,450 ft.

NOBLE COUNTY

Wentz Oil's No. 1 Wolff, C SE NW Sec. 17-20-2w	5,130-78 ft; 2,800 ft. oil in hole.

OKLAHOMA COUNTY

Citizens Oil Co.'s No. 1 Sage Barber, NE cor. Sec. 21-11-3w	S.D. 1,200 ft.
L. C. Hivick's No. 1 Sunset Addition, NW SW NW Sec. 17-11-3w	S.D. 5,515 ft.

PAWNEE COUNTY

Rookstool's No. 1 Wylie, NW NE SW Sec. 6-20-5	S.D. 1,950 ft.

PITTSBURG COUNTY

Moffett & Hall's No. 1 Jones, NW cor. Sec. 14-8-14	Fishing tools 1,675 ft.

PONTOTOC COUNTY

Blackwell Oil & Gas Co.'s No. 1 Abbott, NW SW NE Sec. 14-4-6	S.D. 900 ft.
Williams' No. 1 Krath, NE SE Sec. 33-3-4	Drlg. 870 ft.
Edna Marie's No. 1 McWhirt, NE SE Sec. 11-2-6	S.D. 570 ft.
Sunray Oil's No. 1 Grant, SE NE Sec. 11-4-8	Drlg. 1,960 ft.

(Continued on Page 87)

R. H. SIMPSON KILLED

FORT WORTH, Tex., Oct. 3.—Robert H. Simpson, Fort Worth oil man, was killed Monday when his automobile crashed into a concrete support.

COLON PRODUCTION

Production of Colon Oil Corp.'s subsidiary in Venezuela for the week ended September 23 was 124,690 bbls.

New Potential Tests Ordered in Voshell Pool; Winfield Townsite Is Very Active Area

By W. A. SPINNEY
Staff Correspondent, Kansas Fields

The Kansas Public Service Commission ordered new potential test to be taken on all wells in the Voshell Pool, in McPherson County, Kansas, starting October 4 and continuing until October 9. These potentials will be taken under the supervision of State Umpire L. R. Pickrell. Rules for taking potentials are as follows: "All wells, in both the chat and deep sand pools, shall take a five-day potential production test, beginning at 7 a.m. October 4 and ending 7 a.m. October 9. All wells shall be tested in the manner in which they are normally produced, namely flowing wells to be produced by natural flow, and pumping wells by pumping through 3-inch tubing and by using not to exceed 54-inch pumping stroke. Potentials shall be determined by taking the average daily production for the five-day period. All tanks on all leases, and stock tanks, flow tanks, settling tanks must be gauged and thiefed and measured for water at the beginning of the test at 7 a.m. October 4 and daily thereafter at the same time during the test by a representative of another company owning offset lease or leases.

"All oil run to a pipe line during the taking of this test must be gauged and pipe line run tickets acknowledged by a representative from an adjoining lease by some company other than the one running the oil. Pumping or flowing production into tanks immediately at the well is prohibited. Field men will be notified prior to the starting of the test as to which specific leases they shall be responsible to gauge, but all operators are welcome to gauge any and all properties they might desire to check. No allowance for down time on tests will be made. Prior to commencement of this test every producer must furnish the umpire's representative with a map showing location of all oil, gas, steam and water lines on each lease. Operators are required to keep production by wells separately in so far as it is possible for them to do so. Operators having small wells within the minimum-well class will be requested to test these wells immediately following the general field test. Violation of any of the above rules will automatically void the test."

The daily average production for the State during the period ending October 1 was estimated at 99,920 bbls. a day, which is a decline of approximately 1,000 bbls. daily from the previous week's reports.

In the Hollow Pool

Phillips Petroleum Co.'s No. 1 Warkingtine, NW cor. SW SW, Section 20-22-3w, in the Hollow Pool, Harvey County, made 150 bbls. of oil in three and one-half hours from the Hunton lime at 3,481-91 feet.

Other developments in the area include Lloyd & Frost's No. 1 Martens, NE cor. SE SE, Section 19-22-3w, which was drilling at 3,000 feet. Producers & Refiners Corp.'s No. 1 A. M. Martens, NE cor. NW SE, Section 19-22-3w, was fishing for a bailer.

W. C. McBride, Inc.'s No. 2 in the NW cor. SW, Section 20-22-3w, found the top of the Hunton lime at 3,489 feet and landed the 8-inch casing at 3,490 feet. It was rigging up standard tools before drilling deeper into the Hunton lime.

Shell Petroleum Corp.'s No. 5 in the C NW SW SE, Section 15-26-2, Sedgwick County, which was completed in November, 1929, for 60 bbls. daily from the chat at 2,905-09 feet, was drilled to the Viola lime at 3,199-3,201 feet where it is now pumping 615 bbls. daily. Continental Oil Co.'s No. 2 in the CSL NW SW, Section 15-25-1, Sedgwick County, found the Misener sand at 3,410-12 feet with a showing of oil. It found water at 3,412-13 feet and the water increased at 3,413-33 feet.

Roy Ramsey's No. 1 in the NW cor. SW NW, Section 32-19-9w, on Lot 10, Block 14, Rural High School District No. 2, in the townsite of Chase, Rice County, was rigging up. This is a wildcat test located on a small tract of land.

To Test Ellsworth Wildcat

Derby Oil Co.'s No. 1 in the C NE SE SE, Section 21-16-10w, Ellsworth County, found Siliceous lime at 3,318-62 feet with a showing of oil and water. It was plugged back to 3,358 feet where it was found that 1,000 feet of oil was standing in the hole. It was given a shot of 40 quarts from 3,325-47 feet and the oil in the hole increased to 2,000 feet. The owners are preparing to install pumping equipment.

Voshell Developments

Derby Oil Co.'s No. 2 Neufeldt, NW cor. NE SE, Section 21-21-3w, in the south extension area of the Voshell Pool, in McPherson County, found the top of the chat at 3,070 feet, and after drilling to 3,080 feet is shut down waiting for cement to set after landing casing. This test is the south offset to All States Oil Co.'s No. 1 Neufeldt, which found the chat at 3,078-3,128 feet, where it was completed for 600 bbls. daily. No offset will be forced by the completion of the Derby Oil Co.'s No. 1 Neufeldt.

In the north end of the Voshell Pool, Slick, Pryor & Lockhart's No. 1 Grattan, NE cor. NW NW, Section 34-20-3w, McPherson County, has been drilled 5 feet deeper and has shown a small increase in production. The total depth is now 3,491 feet. The top of the Wilcox sand was found at 3,484 feet. Previous to being drilled deeper the well was producing at the rate of 2 bbls. an hour. No production tests have been made at its present depth and it is not known how much the increase has been. The oil was standing several hundred feet in the hole and a swabbing test is to be made in a few days. It is an old chat combination well that made oil and gas for several years before being drilled deeper to the Wilcox sand in search of larger production. It is the south offset to the same company's No. 1 S. Stuckey, which was a 1,000-bbl. producer in the Wilcox sand.

W. H. Schwartz and others' No. 1 Logback, SW cor. SE NE, Section 12-19-3w, is a new location in McPherson County, 4½ miles northeast of the townsite of McPherson. It is two locations east of the F. Wahn's No. 1 Dixon, which is rated as a 50-bbl. producer from the chat at 2,960-3,006 feet.

Mid-Kansas Oil & Gas Co.'s No. 2 Bridgens, SE cor. NW SW, Section 20-20-3w, was given its first potential test and made 285 bbls. of oil in three hours and is estimated to be a 2,000-bbl. well. No. 1 Bridgens started at 3,000 bbls. per day.

In Eastern Fields

J. E. Mabee and others' No. 1 Nickel, which found the top of the chat at 3,135 feet, was drilled to a total depth of 3,145 feet, where the casing was being landed. The test is located in the extreme south edge of the county and about 1½ miles south of production in the Voshell Pool. The hole was full of rotary mud and it was not known whether or not a showing of oil and gas was found in the chat.

Farrell and others' No. 1 in the C NW SE, Section 21-19-4, Marion County wildcat, is a location, announced during the week.

New wells in Greenwood County, southeast of Hamilton, Troxell & Eisenhour and others' No. 1 Smith, SW cor., Section 5-24-12, made 50 bbls. a day from the Bartlesville sand at 1,725-39 feet. Southwest of Madison, in Greenwood County, Henderson & Holden's No. 3 Harlan, SE cor. NW NW, Section 34-22-11, is estimated at 40 bbls. daily from the Bartlesville sand at 1,872-1,915 feet. It was shot with 190 quarts and was cleaning out.

In Butler County, south of Eldorado, Scanlon and others' No. 1 Marshall, CSL NE SW, Section 11-27-5, found a showing of oil in sandy shale at 2,711-16 feet, but after drilling to the Mississippi lime at 2,750 feet it was abandoned.

Magnolia Petroleum Co.'s No. 1 Schmidt, NE cor. NW NE, Section 30-22-3w, Harvey County, is a new location, about half a mile southwest of production in the Hollow area of Harvey County. It is the only operation of the company in Kansas at this time.

New Work in Kingman

Skelly Oil Co. is preparing to start two additional wells in Kingman County, to

Wildcat Operations in Kansas

(Descriptions are East unless marked otherwise)

BARTON COUNTY

Company, farm and location—	Remarks:
Doherty et al's No. 1 Roesler, SW NE, Sec. 11-18-11w	S.D. 1,975 ft.
Smith et al's No. 1 Wilson, C NW SW Sec. 13-18-14w	Drlg. 1,165 ft.
Skelton Oil Co.'s No. 1 Ott, C SE SE Sec. 16-19-14w	Set liner 3,530-46 ft.; show oil; C.O. 3,604 ft.

BUTLER COUNTY

Cameron-Great Basin Oil Co.'s No. 1 Landon, C SE NW Sec. 13-28-2	Drlg. 2,975 ft.
Ramsey's No. 1 Michael, SW NW NW Sec. 18-27-3	Drlg. 2,000 ft.

COFFEY COUNTY

Baker et al's No. 1 Hertig, NW SW SW Sec. 31-20-14	Drlg. 1,870 ft.

DICKINSON COUNTY

Severs' No. 1 Livingood (O.W.D.D.), SE NW, Sec. 13-13-21	Drlg. 4,810 ft.

DOUGLASS COUNTY

Pure Oil Co.'s No. 1 Limb, NW SE Sec. 31-14-19	Viola 1,762-1,816 ft; S.D. 1,925 ft.

EDWARDS COUNTY

Mid-Kansas O. & G. Co.'s No. 1 Converse, SW NE NE Sec. 30-24-18w	Drlg. 4,850 ft.

ELLSWORTH COUNTY

Buckford's No. 1 Burke, C NE SW Sec. 14-14-9w	Rig.
Viking Oil Co.'s No. 1 Satran, C NW SW Sec. 5-14-9w	S.D. 1,385 ft.
Gurley Bros. and Barnsdall's No. 1 Union Pacific, NW SW Sec. 7-14-7w	Drlg. 755 ft.
Phillips Pet. Co.'s No. 1 Hochman, NE NW SE Section 17-16-7w	Drlg. 1,758 ft.
Morgan's No. 1 Andrews, NE SW Sec. 3-17-8w	Drlg. 1,060 ft.
Walker et al's No. 1 Remley, SW SE NE Sec. 23-14-7w	Drlg. 3,050 ft.
R. Gear et al's No. 1 Kroboth, SE NW Sec. 12-15-10w	Drlg. 220 ft.

FINNEY COUNTY

Joe Denham et al's No. 1 Brown, S SW Sec. 16-25-34w	Rig.
National Ref. Co.'s No. 1 Wells, C SW Sec. 13-23-30w	S.D. 5,872 ft.

FORD COUNTY

Swain et al's No. 1 Henthorn, C NW Sec. 21-25-24w	Drlg. 5,427 ft.

GRAHAM COUNTY

Schleimeyer et al's No. 1 Smith, SE Sec. 24-8-25w	Drlg. 2,600 ft.

HARVEY COUNTY

Liggett et al's No. 1 Davis, SW SE NE Sec. 7-24-1	S.D. 3,415 ft.
Herndon, Blair, Deep Rock, No. 1 Santa Fe, C NW Sec. 19-23-1	Drlg. 3,075 ft.

HASKELL COUNTY

Victor Martin et al's No. 1 Weeks, C NW Sec. 8-28-31w	Rig.

KINGMAN COUNTY

Panhandle Drlg. Co.'s No. 1 Wetheral, C SE NW SW, Sec. 20-28-10w	Set 12-in. csg. 1,610 ft.; S.D.

LEAVENWORTH COUNTY

West et al's No. 1 Karb, C NW NE Sec. 32-10-21	Drlg. 928 ft.

MARION COUNTY

Vernon et al's No. 1 Schmidt, C SW NW Sec. 35-19-1	Location

McPHERSON COUNTY

Darby Pet. Co.'s No. 1 Pankratz, NW SE Sec. 5-20-1	Drlg. 1,755 ft.
Snyder et al's No. 1 Carlson, SE cor. Sec. 4-19-3w	Drlg. 1,675 ft.
Detrick's No. 1 Dalke, NW SE Sec. 16-19-1	Drlg. 3,415 ft.
Sidwell et al's No. 1 Nichols, NE NW NW Sec. 28-17-1n	S.D. 1,205 ft.

MORTON COUNTY

Hydraulic Oil Co.'s No. 1 State Land, NW SE Sec. 22, 34-43w	T.D. 3,640 ft.; temp. abd.

MORRIS COUNTY

Urschel et al's No. 1 Bersuch, NW SE NW Sec. 10-17-7	Drlg. 1,270 ft.

NORTON COUNTY

Richards et al's No. 1 Colby, Sec. 17-4-21w	Rig.

OSAGE COUNTY

Briggs & Smith's No. 1 Wood, SE NW Sec. 21-14-15	S.O. 2,190-2,200 ft.; temp. abnd

PRATT COUNTY

Ninnescah O. & G. Co.'s No. 1 Hardesty, SW SE SE Sec. 28-27-11w	Drlg. 2,536 ft.

RENO COUNTY

National Union's No. 1 Hill, NE SE Sec. 18-24-4w	Location.
Martin et al's No. 1 Yadu, C NW NW Sec. 15-24-5w	S.D. 318 ft.

RICE COUNTY

Langston et al's No. 1 Wells, NE SE Sec. 4-20-9w	Rig.
J. Liggett et al's No. 1 Thodel, C NW NW Sec. 11-21-7w	S.D. 50 ft.

RUSH COUNTY

Barnsdall's No. 1 Schultz, SW cor. Sec. 3-19-16w	Drlg. 3,285 ft.
Skelton et al's No. 1 Brock-Hartman, SW SE NE Sec. 4-18-16w	S.D. 50 ft.

SEDGWICK COUNTY

Scroggins et al's No. 1 Bartlett, NW SE NW Sec. 35-27-1	S.D. 1,522 ft.

SHERIDAN COUNTY

Flo et al's No. 1 Shoemaker, SE SW Sec. 27-7-26w	H.F.W. 4,535-45 ft.; S.D.

STEVENS COUNTY

Argus Prod.'s No. 2 Christopher, C NE Sec. 10-33-39w	S.D. 5,521 ft.;

STAFFORD COUNTY

Stringer et al's No. 1 Swindle, SW NE Sec. 2-25-11w	Spud; S.D.

SUMNER COUNTY

Austin et al's No. 1 Fog, SW SE SE Sec. 14-34-1w	Drlg. 2,926 ft.
Trees Oil Co.'s No. 1 Tompkins, SW Sec. 26-33-1	Location.
Trees Oil Co. and Shell's No. 1 Springate, NE SE SW Sec. 6-34-2	S.D. 3,639 ft.

test the company's block of acreage. The company has already completed three wells on this block. The new locations are reported to be in the SE cor. NW, Section 19-27-10w, and in the NW cor. NE NE, Section 30-27-10w. The company recently completed its No. 1 Leisman, in C SE SW, Section 20-27-10w, for 27,000,000 feet of gas per day from the Siliceous lime, and has staked its No. 2 Leisman, SW cor., Section 20-27-10w.

Winfield is Active

New work is starting in the townsite of Winfield in Cowley County, where 25 wells are now making hole. Two new tests are being spudded and three others are preparing to start operations. The tests spudding are Hinkle and others' No. 2 Bertrand, a twin to No. 1 Bertrand, which is a shallow sand producer, and Davis and others' No. 1 Hott, in the northern part of the field. Rigs were completed at Wakefield and others' No. 1 Walnut Valley, Deal Oil & Gas Co.'s No. 1 Lutheran Orphanage and Roth & Faurot's No. 2 fee, which is a twin to No. 1 fee, a shallow sand producer. Roth & Faurot's No. 6 Moncrief may be plugged back to the shallow sand on account of the fact that two strings of tools were lost in the hole at a total depth of 3,040 feet.

The production of the pool is still under voluntary proration and all the operators are in accord with the terms.

The next test that is expected to reach the sand in the Townsite Pool is the Roth & Faurot's No. 1 Southwestern College, which was drilling in limestone at 3,200 feet.

Reports of the drilling activity in the Winfield Townsite area are as follows: Sinclair Prairie Oil Co.'s No. 5 Dibbens, drilling at 1,550 feet; Dempsey and others' No. 1 Gardenhire, shut down at 2,900 feet; Roth & Faurot's No. 7 Moncrief, 2,750 feet; same operators' No. 5 Southwestern, a rig; Deal Oil & Gas Co.'s No. 1 Covalt, landing 10-inch casing at 1,700 feet; S. A. Murphy and others' No. 2 Reservoir, drilling at 1,820 feet; Dickey and others' No. 1 Smiley, cellar dug; S. A. Murphy and others' No. 1 Observatory, drilling at 1,480 feet; McCole and others' No. 1 Helper, pulling casing to abandon; Blakesley and Wentz' No. 1 Meier, location; Sayles and Aillard's No. 1 Cameron, location.

Cowley County

Slocum and others' No. 1 Cameron, NW cor. NE NW SW Section 27-32-4, old well drilling deeper, drilling at 2,457 feet. McNabb and others' No. 1 Southwestern College, NW cor. SE Section 11-32-4, made 188 bbls. from 3,418-19 feet. Deal Oil & Gas Co.'s No. 1 Cloud, SE cor. NE SE SW Section 22-32-4, made 200 bbls. from 2,341-74 feet. McCole and others' No. 1 Helper, NE cor. SW NE Section 27-32-4, was abandoned at 3,362 feet. Roth & Faurot's No. 1 Cooper, NW cor. SW Section 6-30-6, was abandoned at 2,866 feet.

Barton County

Rankin and others' No. 1 Sooey, C SW NE Section 34-18-12w, is a location.

Butler County

H. Garden and others' No. 1 Brenner, NW cor. SW SE Section 36-26-5, was abandoned at 3,177 feet.

Chase County

Landon and others' No. 1 Crosby, CWL SW NE Section 23-22-9, was drilling at 1,400 feet.

Greenwood County

Gore and Phillips Petroleum Co.'s No. 3 Brothers, NW cor. SE NW NW Section 35-23-11, was abandoned at 1,735 feet. Sheedy and others' No. 5 Bahr, SW cor. NW NW Section 26-23-13, was completed for 3 bbls. from 1,821-34 feet.

Harvey County

F. Hollow's No. 1 School Land, NE cor. SE Section 19-22-3w, made 800 bbls. from the Hunton lime at 3,486-90 feet.

McPherson County

Roland Oil Co. and others' No. 1 Thomas, NE cor. SW Section 26-19-2w, old well drilling deeper, was drilling at 3,114 feet. Vernon Oil & Gas Co.'s No. 1 Lewis, SE cor. SW Section 26-19-2w, old well drilling deeper, was drilling at 3,122 feet. Lario Oil & Gas Co.'s No. 1 Ritz, NE cor. SW Section 1-20-2w, old well drilling deeper, was drilling at 3,095 feet. Same company's No. 1 Hill, SE cor. Section 23-19-2w, was completed for 200 bbls. from the chat at 2,940-57 feet. Same company's No. 3 Gratton, SW cor. SE SW Section 24-19-2w, made 124 bbls. from 2,916-78 feet. Youker and others' No. 3 Bratton, SW cor. Section 24-19-2w, made 100 bbls. from 2,925-81 feet. Boyle and others' No. 2 Smith, NE cor. NW NW Section 29-19-1w, made 840 bbls. from 3,021-37 feet. Detrich and others' No. 1 Dalke, NW cor. SE Section 16-19-1, was abandoned at 3,489 feet.

Marion County

Farrell and others' No. 1 Williamson, C NW SE Section 21-19-4, is a machine.

Rice County

Ramsey and others' No. 1 School Land, NW cor. SW NW Section 32-19-9w, is spudding. National Refining Co.'s No. 1 Sherman, SE cor. SW Section 16-19-9w, made 160 bbls. from 3,190-3,226 feet.

Reno County

T. L. Johnson and others' No. 1 Crofts, NE cor. NW NE Section 27-26-10w, is a location.

Sedgwick County

Fisher & Lauck's No. 10 Trustee, SW cor. NE SE Section 19-27-2, was drilling at 200 feet. Shell Petroleum Corp.'s No. 5 Fisher, NW cor. SW SE Section 15-26-2, made 650 bbls. from 3,199-3,202 feet.

New Policies in Regard to Sales of Burner Oils

CHATHAM, Ontario, Oct. 1.—A new policy of handling the sale of oil burners has been recently adopted by two leading Canadian refining companies, Imperial Oil, Ltd., and British-American Oil Co.

Imperial Oil, Ltd., advertised its plan late in July the aim being to encourage the use of oil burners and fuel oil for domestic heating. The plan is understood to have been confined largely to Toronto, Hamilton and Ottawa, including their suburban areas. The Gilbert & Barker oil burner, manufactured by a Canadian subsidiary of the Standard Oil Co. of New Jersey, is offered for $495 cash or $545.71 over a five-year period during which monthly instalments amount to $9. Provided the consumer uses Imperial fuel oil the burner is guaranteed for a five-year period, with installation and servicing free. Sales are handled by the existing sales organization including Imperial Oil service stations. In a number of service stations the oil burners are on display while others have demonstration units installed. If the plan proves successful its operation next year will be extended to other centers where provision will be made for servicing. It is understood that the average installation uses approximately 2,000 gallons of fuel oil annually.

British American Oil Co. is selling the Fess automatic oil burner, manufactured by a subsidiary of Service Stations, Ltd. The financing plan is slightly different in that, after the $25 initial payment, no further monthly payment is required till the spring. The offer carries a guarantee with free servicing for five years. The offer, so far, applies only to the Greater Toronto area. Choice of six Fess models is offered and the Fess company has withdrawn from the Toronto territory leaving the British American Oil Co. as its sales representative. Sales will be made through trained Fess salesmen and through British American service stations. The financing plan provides for entire payment in cash, for payment in monthly installments over any period up to five years, or for payment over five years made only during the six summer months.

I'M GLAD I BOUGHT A "TOLEDO"

—because now I know what threading satisfaction is. Never a leak, and works easy too. Say—before I bought this "TOLEDO", threading pipe was hard work and often had to be done over, but now my work is easier and always satisfactory. My bet is a "TOLEDO" every time."

You too can find satisfaction with a "TOLEDO". See your dealer at once.

THE TOLEDO PIPE THREADING MACHINE CO.
TOLEDO, OHIO NEW YORK OFFICE, 72 LAFAYETTE ST.

"TOLEDO"
GOOD THREADS

Ross-Meehan Foundries

Manufacturers—

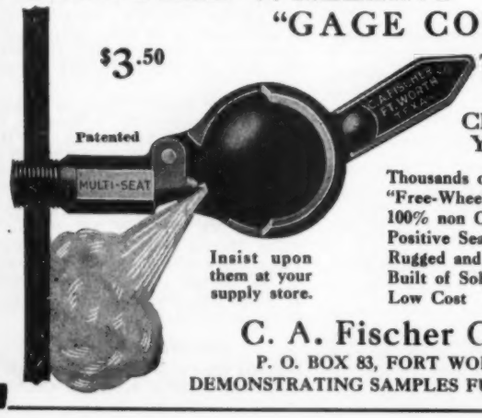
RIVER CLAMPS a Specialty

Williamson Multispeed Winch for Oil Fields
Williamson Drum Units
Electric Steel Castings, Electrically Annealed
"Certified" Malleable Iron Castings
"Meehanite Metal" Castings
Gray Iron Castings
Special Analyses Castings for—
Oil Producers and Refiners

Chattanooga, Tennessee, U.S.A.

The "FREE-WHEELING"
"GAGE COCK" WITH
THOUSANDS OF SEATS
CHECK FOR YOURSELF

$3.50



Patented

Insist upon them at your supply store.

Thousands of Seats	√ √
"Free-Wheeling" Lead Ball	√
100% non Corrosive	√
Positive Seal	√
Rugged and Fool Proof	√
Built of Solid Bronze	√
Low Cost	√ √

C. A. Fischer Company
P. O. BOX 83, FORT WORTH, TEXAS
DEMONSTRATING SAMPLES FURNISHED FREE

Discover Production on Darrow, La., Salt Dome; Possible New Field in Tyler County, Texas

By NEIL WILLIAMS
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Oct. 3.—Field developments the past week on the Gulf Coast were featured by the discovery of production on the Darrow geophysical salt dome prospect in Ascension Parish, Louisiana, and by the apparent opening of another new field of some kind in Tyler County, Texas. The latter, a rank wildcat, in a drill stem test showed for an estimated 30,000,000 feet of dry gas, the first production in that county, and now casing is to be set preparatory to the setting of screen.

At Darrow, Rio Bravo Oil Co.'s No. 1 Community, 200 feet from the north line and 1,500 feet east at right angles from the southwest corner of Section 15-10s-2e, was completed as the first producer on that prospect. It set 29 feet of 7-inch screen in a sand at a total depth of 4,035 feet and flowed 490 bbls. of pipe line oil, through a one-quarter-inch choke, in 10 hours. Because of lack of storage it was choked down further for a short time and then closed in and has been standing since then. Working pressure of the well was 436 pounds and shut in pressure is 375 pounds.

This well is the first test drilled by the Rio Bravo Oil Co. at Darrow and is in the middle of a 3,000-acre block, a half interest in which recently was acquired from the Gulf Refining Co. for the drilling of the well. The latter company, in 1929, had drilled one test in Section 27 which was abandoned as dry in a hard sand at a total depth of 5,575 feet. Another dry hole, abandoned at 3,778 feet and located in Section 32, was drilled by Belle Helen Oil Co. These operations constitute all the important drilling which has been done in the immediate area.

Darrow, itself, was discovered by geophysical exploration during 1927 but for various reasons lay idle for a couple of years. So far no salt has been drilled into to prove the dome. As checked by geophysical instruments it lies in the Mississippi River, some 40 miles down the river from Baton Rouge. Location of the Rio Bravo well is just off the main paved highway between New Orleans and Baton Rouge.

As the Mississippi River is navigable even to the largest tankers as high up as Baton Rouge, location of the well on the bank of the river will facilitate moving of the oil by water. Disposition of the oil has not been determined, but it is likely it will be barged to the Gulf Refining Co.'s plant at Port Arthur.

Darrow is the second field in Ascension Parish, the other being Sorrento, some 15 miles to the east, which was discovered in February, 1928, as the first coastal field east of the Mississippi River.

Possibly of more interest from a standpoint of new activity and wildcat play is Republic Production Co. and Houston Oil Co.'s No. 1 Sterne fee, a rank wildcat 3 miles southeast of Spurger in the extreme eastern part of Tyler County. This test encountered sand at 4,698-4,708 feet and in a drill stem test with the tool seated at 4,675 feet showed dry gas within one minute. The volume was estimated at 30,000,000 feet daily and pressure was 750 pounds through a three-eighths inch choke. After the tool was closed the gas continued to blow for 30 minutes. A string of 7-inch casing will be run.

Tyler County Discovery

Tyler County, along with Jasper County, adjoining to the east, and Newton County, adjoining Jasper to the east, is rank virgin territory except for some small production in the extreme north of Jasper County. Those counties are in that tier of counties lying just north of the salt dome district and between the latter and the East Texas counties. They follow along that trend of play eastward from Montgomery County, where the Conroe Field is being developed, and lately have been the center of attention in leasing, which has extended across into Louisiana.

The Republic Production Co.'s discovery is looked upon with considerable importance in view of the expected development of major production along that trend of play, the development having been given impetus by the discovery of the Conroe Field in Montgomery County. Wildcat drilling now is getting under way in that part of the State. In what is known as the Wiess Bluff district in southwestern Jasper County, Gulf Production Co. has a rig up for No. 1 Miller Vidor, 2,893 feet south and 112 feet east of the northwest corner of the Sarah Gray Survey, and by the time this is read should be drilling. Just west across the Neches River in Hardin County (this county just south of Tyler County adjoins the southern part of Jasper County to the west), Republic Production Co. is rigging up for No. 1 Ben Andrus fee, 1,140 feet west of the Neches River and 345 feet north at right angles in the Van Meter Survey. Several miles north of the Gulf test in Jasepr County, Houston Oil Co. has a rig up for No. 1 Richardson fee, 2,000 feet south and 3,003 feet west of the northeast corner of the Ben Richardson Survey. In the extreme southern part of Newton County, Sun Oil Co. has been drilling an interesting wildcat in its No. 1 Peevey-Moore, which now is down 5,395 feet. It is on a geophysical salt dome prospect.

Conroe Development

Continued increasing activity was felt at Conroe where now 34 operations are drilling with new locations constantly being made. The following new wells were completed during the week: Humble Oil & Refining Co.'s No. 7 South Texas Development Co., Humble's No. 2-A Cartwright, Hooper Oil Co.'s No. 1 Hooper, Houston Oil Co. and Heep Oil Corp.'s No. 1 Hooper and Humble's No. 1 Plaeffin, each having initial production ranging from 1,500 to 2,000 bbls. Mounting production is figuring conspicuously in Gulf Coast production figures. The temporary injunction recently given the Alpha Petroleum Co. restraining the Railroad Commission and the State from enforcing proration orders has enabled a number of wells to run open and consequently there is no restraint on the field except the better judgment of the operators. Daily output now has been increased to above 20,000 bbls., this being augmented by a constant string of new wells now being brought in.

Humble Oil & Refining Co. still continues active in buying not only of leases but also royalties under its leases. This company controls the major portion of the present known field but has been extending its holdings steadily farther to the east and southeast of the activity.

Additional completions the past week included two good wells at Rabbs Ridge, Fort Bend County, including Gulf Production Co.'s No. 1 Gubbels, an offset to The Texas Company's No. 1 Wolters recently completed as a half mile northward extension to production, and which started drilling activity outside of the Gulf Production Co. and Humble Oil & Refining Co.'s joint block. The Texas Company now has its second well on the same lease on the sand at 5,170-84 feet and has cemented 7-inch casing at 5,160 feet to test. The extension district is divided into tracts held individually by The Texas Company, Humble Oil & Refining Co. and Gulf Production and adjoin immediately to the north the Humble and Gulf joint block.

Barbers Hill

At Barbers Hill, Texas Gulf Producing Co. brought in its No. 4-C Kirby, east side of the dome, flowing 200 bbls. of pipe line oil from sand at a total depth of only 3,975 feet, which is one of the highest wells that has been completed in the play which has been going along on the east flank in developing subsalt sands. This test drilled through salt at 1,385-3,278 feet. Sun Oil Co.'s No. 3 Higgins, southeast side of the dome, also was among Barbers Hill completions, it making 300 bbls. daily from a shallow sand at 3,018 feet.

Other completions included The Texas Company's No. 7 Hannah, Hull, a former well deepened to 5,096 feet, 600 bbls. daily, through a three-eighths inch choke; Union Sulphur Co.'s No. 3 Martha Moss, Lockport, 1,500 bbls. fluid, 50 per cent net oil, 6,547 feet, and Rio Bravo Oil Co.'s No. 88-A Jordit, Saratoga, 10 bbls., 1,204 feet. A number of other wells at Conroe, Rabbs Ridge and Barbers Hill are due to be completed.

Increasing drilling activity continued to feature Gulf Coast developments and attention of operators generally apparently has been directed at the coastal country. Within the past several months three of the larger Mid-Continent companies, including Mid-Continent Petroleum Corp., Barnsdall Oil Co. and Tidal Oil Co., have established land and geological branches at Houston and other companies are reported coming into this territory. In addition to the large amount of new drilling being undertaken, larger companies steadily have been acquiring additional acreage and block and a sizable amount of geophysical exploration, particularly reflection shooting, is being started.

Gulf Coast Fields and Wildcats

Week Ending October 1

RACCOON BEND—AUSTIN COUNTY

Company, farm and location—	Remarks:
Humble Oil & Ref. Co.'s No. 5 J. W. Wilson, Wm. Harvey Sur., 2,380 ft. southeasterly along NE line from N cor. of tract and thence 412 ft. southwesterly at right angles	Drlg. sandy shale 2,582 ft.

DAMON MOUND—BRAZORIA COUNTY

Intercoastal Oil Co.'s No. 10 Wisdom, A. Darst Sur., 440 ft. from NW line and 170 ft. from SW line of tract	Rig.

WEST COLUMBIA—BRAZORIA COUNTY

The Texas Company's No. 7 Abrams (W.O.), George Tennille Sur.	Sand and shale showing oil 3,171 ft.; cmtd. 4½-in. csg. 3,146 ft.

BARBERS HILL—CHAMBERS COUNTY

R. E. Ferrell's No. 2 Wilburn, Henry Griffith League, 215 ft. W of No. 1 in center of 40-acre tract	T.D. 3,000 ft. in shale; fishing.
Humble Oil & Ref. Co.'s No. 1 Kirby, Henry Griffith League, 208 ft. from S line and 100 ft. from E line of lease	Rock 1,020 ft.; cmtd. 13⅜-in. csg.
Mills Bennett Prod. Co.'s No. 5 Means, Henry Griffith League, 200 ft. W of No. 4	Cap rock 842-48 ft.; cmtd. 13⅜-in. csg.
Mills Bennett Prod. Co.'s No. 5 Kirby, Henry Griffith League, 400 ft. from W line and 41 ft. from S line of tract	Spudded.
Sun Oil Co.'s No. 3 Higgins, Wm. Hodges Sur.	Set 48 ft. of screen 3,018 ft.; comp. flowing 325 bbls., ½-in. choke.
The Texas Company's No. 2 Wilburn (W.O.), Henry Griffith League, 70 ft. from N line and 330 ft. from E line of tract	Pulling screen to deepen 5,112 ft.
Texas Gulf Prod. Co.'s No. 4 Ilfrey, Henry Griffith League, 894 ft. from E line in C of tract	Derrick.
Texas Gulf Prod. Co.'s No. 3-C Kirby, 562 ft. from W line, 50 ft. from S line of "C" lease	Set 51½ ft. of 7-in. screen 5,224 ft.; swabbing.
Texas Gulf Prod. Co.'s No. 4-C Kirby, Henry Griffith League, 388 ft. from W line and 50 ft. from S line of "C" lease	Set 115 ft. of 4-in. screen 3,975 ft.; comp. flowing 200 bbls. daily.
Texas Gulf Prod. Co.'s No. 11-A Kirby, Henry Griffith League, 1,090 ft. from W line and 225 ft. from S line of "A" lease	Salt 3,424 ft.; cmtd. 9⅝-in. csg.
Texas Gulf Prod. Co.'s No. 2 T. H. McLean, Henry Griffith League, 711 ft. from E line midway between C. Barber and McLean tracts on separating line	Salt 1,258-2,503 ft.; plugged to 1,181 ft. to straighten hole.
Texas Gulf Prod. Co.'s No. 2 O. K. Winfrey, W. D. Smith Sur., 295 ft. N of SW cor. of A. E. Barber lease and 100 ft. W of E line of Winfrey lease	Cap rock 2,940-3,088 ft.; cmtd. 13⅜-in. csg. 2,952 ft.
Yount Lee Oil Co.'s No. 4-A Zadie Fisher, Wm. Bloodgood Sur., 301 ft. from W line and 96 ft. from S line of tract	Sand 5,677-5,704 ft.; setting screen.

LOST LAKE—CHAMBERS COUNTY

Pure Oil Co.'s No. 16 Mayes, E. H. R. Wallis Sur., 1,825 ft. N and 1,429 ft. E of No. 1 Lost River	Spudded.

ORCHARD—FORT BEND COUNTY

Gulf Prod. Co.'s No. 34 Moore, Mark Smith Sur.	Drlg. hard sand 3,206 ft.

RABBS RIDGE—FORT BEND COUNTY

Gulf Prod. Co.'s No. 1 Gubbels, 300 ft. E and 300 ft. N of SW cor., Blk. 4, Samuel Kennedy Sur.	Comp. flowing 1,500 bbls. daily 5,212 ft.
Gulf Prod. Co.'s No. 2 Gubbels, Samuel Kennedy Sur. (location to come)	Rigging up.

(Continued on Page 87)

Kettleman Well Is Producing Below Whepley; Flow Test Begun in Playa del Rey Field

By L. P. STOCKMAN
Staff Correspondent, California Fields

LOS ANGELES, Calif., Oct. 1.—The executive committee for equitable curtailment has decided that California operators must limit crude oil production to a maximum of 440,000 bbls. per day for the balance of the current year. In a resolution, the committee points out that there is a demand "in and from the State for oil currently produced for less than 440,000 bbls. daily for the months of October, November and December, 1932." It adds that any production in excess of the prescribed allotment would constitute physical and economic waste and petitions operators to limit production during the period in question to their pro rata share as determined by the oil umpire. The new allotment of 440,000 bbls. per day became effective at 7 o'clock, October 1, but it will probably be several days before this reduction is reflected in current production.

To Make Flow Test

Beginning Monday morning, Umpire J. K. Pemberton will begin a flow test to determine the potentiality of the Playa Del Rey Field in order to equalize the daily allotment of individual wells. This flow test will be for a 10-day period and oil produced in excess of the allowable must be offset by a similar underproduction within 30 days. An open-flow test will be conducted in the Santa Fe Springs Field, beginning October 15 and concluding on October 26, or as long thereafter as may appear advisable or necessary. Long Beach operators will be given a chance to establish new potentials from November 1 until November 11, and this flow test will be followed by another reestablishment of potentials at Huntington Beach from November 15 to 26. In a notice sent out to operators, Umpire Pemberton has called attention to the fact that for proration purposes the potential production of a well is not its maximum short-time capacity flow but rather its average daily production during a month of normal operation. In order to establish the maximum normal production, the average production of each well during the last five days of its flow test will be considered to be its established potential unless such average is clearly disproportionate to the average production of the entire test. It is estimated that many wells will require an expenditure in excess of $5,000 to equip them properly for 10-day production tests. This is due to the fact that many of the wooden rigs have been weakened by termites or rotten supports, while in other cases the foundations have been undermined by rains and some partially dismantled in order to use equipment in other producing wells. In other words, operators in the Playa Del Rey, Santa Fe Springs, Long Beach and Huntington Beach Fields will be obliged to undertake a general reconditioning of all properties in the fields involved. There have not been any flow tests conducted in any of the fields in Los Angeles Basin since February, 1930, and those in charge of curtailment believe that one should be conducted to determine definitely the maximum potential and thus enable Umpire Pemberton to allocate the new allotments equitably. To conduct the flow test beginning Monday, Umpire Pemberton will be obliged to engage the services of approximately 50 additional gaugers.

Kettleman Hills

Developments in the Kettleman North Dome Field during the past week were both good and bad, depending upon the viewpoint. The favorable factor centers around the bottom of the Temblor in this field as engineers have been of the opinion that the Whepley shale marked the bottom of the Temblor. This opinion was disproved, however, upon completion of the Kettleman North Dome Association's well No. 81-4 P. This new producer, bottomed at 8,309 feet, is producing from both above and below the Whepley shale. The well was finished with a 5¾-inch liner including 920 feet of perforated and was brought in under a natural flow doing 2,143 bbls. of exceptionally clean 42.4 gravity oil and 10,774,000 feet of natural gas per day. Above the 5¾-inch liner, Kenda landed a 6⅝-inch flow string at 6,151 feet. The Kettleman North Dome Association is making preparations to drill a conclusive test in the North Dome and it is the present intention to carry this project down to determine the possibility of developing deeper production below the present productive Huffman zone. This test is apparently the outgrowth of deep zone exploration in the North Belridge Field of Kern County where the Belridge Oil Co. is believed to have found substantial production in the Niocene formation.

The unfavorable development in the Hills during the past week is due to the rather unpromising condition of the North Kettleman Oil & Gas Co.'s No. 1 Lillis-Welch in Section 24-21-16. This well, the most westerly project to be drilled in the North Dome up to the present time, has already penetrated in excess of 1,000 feet of Temblor formation without showing any favorable indications. This well cannot be definitely eliminated at its present depth, 8,950 feet, as it may still pick up the Huffman zone, although the outlook is not any too favorable. The Union Oil Co. picked up the Bentonite marker in No. 2 Amerada King at 7,015 feet and, after landing a string of 8⅝-inch at 7,038 feet, proceeded to drill to its present depth, 7,300 feet, where the prevailing formation is a hard gray sandy shale. No. 2 Amerada King is correlating very close to the log of the original well drilled on this property and should be listed for completion at approximately 8,300 feet within 60 days. The Japanese navy has awarded contracts to the Union and Standard for the delivery of approximately 420,000 bbls. of Kettleman Hills crude at an average price of $1.14 per barrel. The Union Oil Co. has contracted to deliver 280,000 bbls. of Kettleman crude aboard tanker at Port San Luis, while the Standard will deliver 140,000 bbls. of similar oil f.o.b. ships at Estero Bay. This is the first time that California companies have landed such a large contract for refinable crude for the Japanese navy and the deal came as a complete surprise in view of the previous report that Japan had made a deal with the Russian government.

Fruitvale

The Sea Hawk Petroleum Co. completed a well in the Fruitvale Field of Kern County early in the week and, judging by the status of other wells in this area, completion may be expected during the week. The Sea Hawk's new producer is No. 2-B, located in Section 23-29-27. This well, bottomed at 3,785 feet and finished with a string of 6⅝-inch casing landed at 3,616 feet and a 4¾-inch liner carrying 178 feet of perforated, came in under a natural flow doing 368 bbls. of clean 22.8 gravity oil per day through a thirty-two-sixty-fourths inch bean under a pressure of 640 pounds. Two new wells are scheduled to be started in the Fruitvale Field soon and spud will probably be made in the very near future. Harold Kane of Long Beach has completed a wooden derrick for the Harrison Oil Co. on the Bittner lease in Section 23-29-27 and rotary equipment is being rigged up. This offsets Treasure Oil Co.'s No. 1 DeBretteville and is the first of three wells to be drilled on the 13-acre Bittner lease if subsequent developments warrant.

Mount Poso

In the Mount Poso Field, the Modoc has concluded drilling operations on No. 2 Vedder at 1,530 feet and the well is bailing for production. The Pongratz Oil Co. has also completed a well in this area and it is being put on the beam at 1,503 feet. Hoke Woodward has cemented his No. 1 Vedder in oil sand at 1,494 feet and an early test is contemplated. In the Midway Field, the Standard is coring a hard sterile sand in No. 1 Mascot, a deep test at 9,701 feet. The Continental Oil Co. is rotating in No. 3 Result, a recent spud in the North Belridge Field of Kern County at 4,040 feet. This well will be bottomed in the Temblor as operators are in general accord with a gentlemen's agreement to refrain from exploitation of the underlying Eocene, which the Belridge Oil Co. is believed to have found productive several months ago. The Belridge interests are limiting their development work to two strings of tools, No. 51-27 rotating at 4,790 feet and No. 27-35 making hole at 5,394 feet. The Ohio Oil Co. is making good footage in No. 1 Bloomer, an outpost which is being carried down as a deep test before quitclaiming the lease. The General Petroleum has spudded in No. 2 Morris, a new well in the Buttonwillow gas field of Kern County, and is making normal progress. This well is scheduled for completion around the 3,000-foot level and should be in a position to go on production before the end of October if the occasion demands.

The Associated Oil Co. spudded in a new well in the Ventura Avenue Field early in the past week and is now running four strings of tools in this district. The General Petroleum is rotating in No. 15-A Barnard at 2,482 feet, but this projected deep zone test, which is equipped to go down to 10,000 feet if necessary, will not be finished for several months. The rotary is the heaviest type obtainable and the pipe being used is of the highest tensile strength. The rig foundation is of reinforced concrete supported by steel girders intended to withstand the greatest strains. One of the most interesting developments in connection with drilling operations in the Ventura Avenue Field is in the use of superheaters which, contrary to previous work, are now located adjacent to the rigs and not near the boilers, as has been done heretofore. The Associated is using two superheaters at Ventura Avenue and the General Petroleum and Shell, one each. By using a superheater, operators in this field are able to use long steam lines in the drilling of new wells and thus do not find it necessary to install a new battery of boilers at each well. The steam after traveling through these relatively long steam lines, is quite wet but is quickly converted to the required degree of dryness by the superheaters.

Elwood

Foundations are going in for three new wells in the Elwood Field of Santa Barbara County but since this work is not being pushed under rush orders it will probably be another few weeks before any of this trio is in a position to begin making hole. The Indian Petroleum is still busily engaged in constructing a short drilling pier and well head and has not yet started rig construction for its projected tideland test in the Rincon Field of Ventura County. The Bolsa Chica's tideland wildcat in the Coal Oil Point area of Santa Barbara County was given a preliminary production test several days ago and, while it showed a short preliminary flow by heads, only a small showing of oil was noted. This was an open hole test and the company is

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Intercoastal-domestic—						
Diesel and gas oil	.....	.....	.....	.....	534,120	1,379,883
Gasoline	.....	.....	385,703	55,100	5,962,160	10,040,948
Kerosene	.....	.....	.....	.....	154,372	187,934
Foreign exports—						
Crude oil	214,322	30,617	164,002	23,429	6,102,543	5,622,236
Fuel oil	205,047	29,292	53,639	7,663	6,163,258	10,145,557
Diesel and gas oil	49,960	7,137	79,328	11,333	1,795,565	2,727,749
Gasoline	111,868	15,981	110,699	15,814	6,139,272	6,485,549
Kerosene	100,533	14,362	77,411	11,059	2,062,149	1,231,449
Lubricants	....	....	.....	.....	.....	36,353
Naphtha distillates	.....	...	.....	.....	120,075	.....
Coastwise-domestic—						
Crude oil	265,002	37,857	254,435	36,348	10,439,943	16,619,585
Fuel oil	199,374	28,482	178,299	25,471	8,577,704	9,203,224
Diesel and gas oil	74,611	10,659	10,014	1,431	939,262	1,130,716
Gasoline	285,974	40,853	265,364	37,909	11,139,984	10,358,594
Kerosene	14,599	2,086	.....	.....	132,093	226,307
Naphtha distillates	.....	.....	.....	.....	.....	4,952

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Diesel and gas oil	.....	.....	.....	.....	403,361	.....
Gasoline	.....	.....	74,465	10,638	652,856	732,169
Kerosene	.....	.....	.....	.....	75,760	.....
Lubricants	.....	.....	.....	.....	23,829	35,236
Foreign exports—						
Crude oil	....	.....	.....	.....	707,651	249,081
Fuel oil	.....	.....	153,379	21,911	798,098	1,202,690
Diesel and gas oil	.....	.....	.....	.....	519,332	386,912
Gasoline	107,304	15,329	22,163	3,166	2,671,785	3,161,211
Kerosene	.....	.....	.....	.....	757,550	629,067
Lubricants	.....	.....	.....	.....	30,094	25,693
Coastwise-domestic—						
Fuel oil	108,822	15,546	.....	.....	2,163,459	2,678,135
Diesel and gas oil	8,871	1,267	.....	.....	321,433	346,660
Gasoline	7,498	1,071	148,372	21,196	2,731,292	3,240,767
Kerosene	.....	.....	4,079	583	84,546	242,370
Naphtha distillates	.....	.....	.....	.....	.....	49,780

contemplating the advisability of cleaning out the hole and then retest after landing a short liner. This well was originally drilled to 5,510 feet but has been plugged back to the bottom of the Vaqueros logged at 4,026 feet.

Long Beach

P. G. Cummings has recompleted his No. 3 Baehr in the Long Beach Field after redrilling to 4,418 feet. Bottom of the hole is 6,259 feet and the well was returned to production pumping 186 bbls. of relatively clean 29.1 gravity oil per day. Two new wells are being started in the Long Beach Field. The Dabney-Johnston Oil Co.'s No. 87, will be spudded in within a few days. The other project is the Young Petroleum Co.'s No. 3 Hilton, the rig for which is now in course of construction. The Hancock Oil Co. began reconditioning its No. 10 in the Long Beach Field a week or 10 days ago and, after cleaning out to bottom, decided to perforate the 8¼-inch casing. During this operation the well blew out but died within an hour. In the Rosecrans Field of Los Angeles Basin the Barnsdall Oil Co. is nearing the 6,800-foot level in No.

(Continued on Page 87)

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

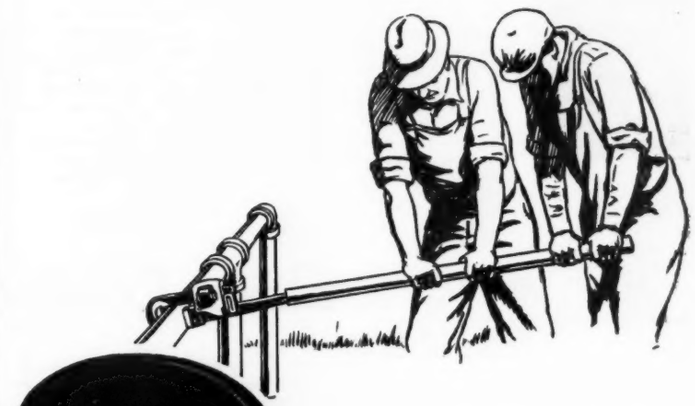
Company, well and location—	S.T.R.	Depth	Status
Hines Pet., No. 1 Ocean Park, Los Angeles Co.	9- 2-15	7,414	suspended
Taylor Oil Co., No. 1 Culver, Los Angeles Co.	12- 2-15	6,238	suspended
Co-operative Dev. Co., No. 1 Del Rey, Los Angeles Co.	26- 2-15	5,024	sd. sh. drilling
Palm Ridge Oil Co., No. 1 Palms, Los Angeles Co.	2- 2-15	511	sd. sh. drilling
Hogan, N. S., No. 1 Hawthorne, Los Angeles Co.	23- 3-24	101	suspended
Lawndale Pioneers, Inc., No. 1 Peck, Los Angeles Co.	20- 3-14	6,378	suspended
Baldwin Oil Co., No. 9 Inglewood, Los Angeles Co.	7- 2-14	5,761	br. sh. drilling
Baldwin Hills Synd., No. 1 Inglewood, Los Angeles Co.	17- 2-14	4,090	suspended
Kyle, W. A., No. 1 Inglewood, Los Angeles Co.	7- 2-14	4,318	plug back
Allison Synd., No. 1 Inglewood, Los Angeles Co.	7- 2-14	6,110	pumping test
El Dorado Oil Co., No. 1 Puente, Los Angeles Co.	30- 2- 9	2,860	suspended
Durgin & Allen, No. 1 Spadra, Los Angeles Co.	33- 1- 9	1,114	sd. sh. drilling
Jones, W. L., No. 1 Bell, Los Angeles Co.	31- 2-12	2,281	sd. sh. drilling
Blinn & Gray, No. 1 Montebello, Los Angeles Co.	6- 2-11	5,060	suspended
McNeil, A. W., No. 1 Montebello, Los Angeles Co.	7- 2-11	rig	suspended
Hutchinson & Andrews, No. 1 El Monte, Los Angeles Co.	11- 1-11	rig	rigging up.
Yellowstone Oil Co., No. 1 Alhambra, Los Angeles Co.	24- 1-13	3,919	suspended
Caballero Estates, No. 1 Calabasas, Los Angeles Co.	23- 1-16	1,604	suspended
Smith, J. H., No. 1 Hasley, Los Angeles Co.	32- 5-17	3,212	bailing
Marble, Willard, No. 1 Chatsworth, Los Angeles Co.	6- 2-16	1,396	suspended
Ball, W. T., No. 1 Newhall, Los Angeles Co.	34- 3-16	3,399	suspended
Ajax Pet., No. 1 Newport, Orange Co.	21- 6-10	7,259	suspended
Nuoil Co., No. 1 Newport, Orange Co.	29- 6-10	1,970	suspended
Mineral Exploration, No. 1 Capistrano, Orange Co.	8- 8- 7	3,316	hd. sd. drilling
Orangethorpe Pet., No. 1 Brea, Orange Co.	32- 3-10	4,560	suspended
Spindletop Oil Co., No. 1 Salton Sea, Riverside Co.	25- 7-10	3,590	suspended
Duncan, N. L., No. 1 Sagebrush, Riverside Co.	8- 4- 6	1,157	suspended
Colan Dev. Co., No. 1 Redlands, San Bernardino Co.	25- 1- 2	2,392	suspended
Great American Pet., No. 1 Chino, San Bernardino Co.	18- 2- 8	....	material
Mason Oil Co., No. 1 Salton Sea, Imperial Co.	1-17-15	680	sd. sh. drilling
Woods, D. H., No. 1 Salton Sea, Imperial Co.	7-11-16	774	sd. sh. drilling
Borderland Oil Co., No. 2 Encinitas, San Diego Co.	29-16- 4	2,677	suspended
South Bay Oil Co., No. 1 Border, San Diego Co.	31-18- 2	1,243	suspended
Shannon, G. H., No. 1 Kearney, San Diego Co.	14-15- 3	446	suspended

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Standard, No. 1 Santa Rosa Island, Santa Barbara Co.	unsurveyed	3,560	gr. sd. drilling
Field Gasoline Co., No. 1 Lompoc, Santa Barbara Co.	6- 7-33	2,208	sd. sh. drilling
Superior Oil Co., No. 1 Santa Maria, Santa Barbara Co.	1- 9-33	661	core hole
Wilson, N. S., No. 1 Los Alamos, Santa Barbara Co.	2- 7-35	4,979	suspended
Equity Oil Co., No. 1 Coal Oil Point, Santa Barbara Co.	24- 4-29	3,750	suspended
Bolsa Chica, No. 1 Coal Oil Point, Santa Barbara Co.	25- 4-29	5,510	prod. test
Deuel and associates, No. 1 Naples, Santa Barbara Co.	7- 4-29	5,134	suspended
Oakburn Oil Co., No. 1 Capitan, Santa Barbara Co.	tideland	2,821	testing
Casitas Oil Co., No. 1 Carpinteria, Santa Barbara Co.	tideland	75	sd. drilling
Cuyama Oil Co., No. 1 Cuyama, Santa Barbara Co.	12-10-27	760	coring
Associated, No. 1 Rincon Creek, Ventura Co.	19- 4-24	2,080	suspended
Richfield Oil Co., No. 1 Rincon, Ventura Co.	4- 3-24	4,740	sd. sh. drilling
Indian Pet., No. 1 Rincon, Ventura Co.	tideland	....	building pier
Sovereign Oil Co., No. 1 Fillmore, Ventura Co.	23- 4-19	....	building road
Honolulu Consolidated, No. 1 Miguelito, Ventura Co.	23- 3-24	....	material
Wilshire Oil Co., No. 1 Sulphur Mountain, Ventura Co.	20- 4-21	317	rig cable tools
Superior Oil Co., No. 1 Timber Canyon, Ventura Co.	13- 4-21	4,270	sd. sh. drilling
International Oil Developers, Inc., Ltd., No. 2 P. (Powell).	33- 2-20	2,056	drilling
Hay Petroleum, No. 1 Weed Patch, Kern Co.	22-30-29	....	location
General Pet., No. 2 Buttonwillow, Kern Co.	6-28-23	508	sd. sh. drilling
Milham Exploration, No. 18 Buttonwillow, Kern Co.	17-28-23	2,646	testing
Milham Exploration, No. 19 Buttonwillow, Kern Co.	8-28-23	mtl.	building rig
Purman, T. H., No. 1 McKittrick, Kern Co.	22-29-21	4,610	suspended
Wilport Oil Co., No. 2 McKittrick, Kern Co.	19-29-21	640	reaming
Ozena Oil Co., No. 2 McKittrick, Kern Co.	27-29-21	2,861	hd. sd. drilling
General Pet., No. 1 Belridge, Kern Co.	30-28-21	8,260	suspended
Wallace, K. C., No. 1 Belridge, Kern Co.	32-29-21	4,222	suspended
Rio Cal Pet., No. 1 Shale Hills, Kern Co.	2-27-18	2,355	suspended
Cumberland Oil Co., No. 2 Devils Den, Kern Co.	17-26-18	3,263	suspended
Hallaway, A. S., No. 1 Devils Den, Kern Co.	11-25-18	675	fishing
Hannah, Tom, No. 1 Devils Den, Kern Co.	25-25-18	3,516	cleaning out
Pyramid Hills Oil Co., No. 1 Devils Den, Kern Co.	24-25-18	1,724	suspended
Fowler, F., No. 1 Blackwell Corner, Kern Co.	15-26-19	3,170	suspended
Regina Oil Corp., No. 1 Mojave, Kern Co.	26-10-14	3,152	hd. sd. drilling
Harding, J. B., No. 1 Mojave, Kern Co.	5-10-10	1,030	suspended
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-11-19	6,025	suspended
Descanso Oil Co., No. 1 Tejon, Kern Co.	31-11-19	2,749	suspended
Kingsburg Expl. Co., No. 1 Kingsburg, Fresno Co.	30-16-23	2,970	suspended
Kent & McDonald, No. 1 Carrizo Plains, San Luis Obispo	3-32-22	2,860	suspended
Emerich Oil Co., No. 1 Carrizo Plains, San Luis Obispo	22-32-22	1,841	suspended
Trav-El Oil Co., No. 1 Carrizo Plains, San Luis Obispo	7-32-22	2,450	suspended
Indian Dome Oil Co., No. 1 Edna, San Luis Obispo Co.	26-31-12	3,352	suspended
Martin, J. D., No. 3 Edna, San Luis Obispo Co.	5-31-13	411	suspended
Paso Robles Oil Co., No. 1 Edna, San Luis Obispo Co.	27-27-11	4,191	suspended
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	1-29-12	1,650	suspended
Shell, No. 1 San Miguel, San Luis Obispo Co.	4-25-12	2,080	hd. sd. drilling
Pacific Inland, Well No. 1, Monterey Co.	19-23-15	2,441	suspended
Brown, W. F., No. 1 Parkfield, Monterey Co.	15-23-14	1,051	suspended
Thomas Pet. Co., No. 1 Parkfield, Monterey Co.	31-22-14	198	suspended
Guess, E. B., No. 1 Corcoran, Kings Co.	7-21-21	6,197	suspended
Woodward, Glen, No. 1 Dudley Ridge, Kings Co.	32-22-20	775	suspended
Scott Bros. Drlg. Co., No. 1 Dudley Ridge, Kings Co.	18-22-19	1,843	suspended
Lacal Natural Gas Co., No. 1 Dudley Ridge, Kings Co.	32-22-20	341	suspended
Kettleman Natural Gas Co., No. 1 Dudley Ridge, Kings Co.	18-22-19	1,100	suspended
Irma Investment Co., No. 2 Dudley Ridge, Kings Co.	7-23-20	1,224	suspended
Triune Oil Co., No. 1 Dudley Ridge, Kings Co.	5-23-20	1,098	testing
Dudley Dome Oil Co., No. 1 Dudley Ridge, Kings Co.	9-23-20	404	cemented
Eagle Oil Co., No. 2 Dudley Ridge, Kings Co.	15-23-20	1,342	suspended
Knudsen & Schmidt, No. 1 Reef Ridge, Kings Co.	36-23-17	5,775	sd. sh. drilling
Kettleman Ridge Oil Co., No. 1 Avenal, Kings Co.	10-23-16	1,148	suspended
Kettleman Ridge Oil Co., No. 2 Avenal, Kings Co.	10-23-16	rig	suspended
Magee & Stone, No. 1 Alpaugh, Kings Co.	34-24-22	5,060	suspended
Western Resource Corp., No. 3 Dudley Ridge, Kings Co.	12-23-22	1,840	suspended
Ducor Pet. Co., No. 1 Ducor, Tulare Co.	14-24-27	2,200	suspended
Inland Valley Oil Co., No. 1 Visalia, Tulare Co.	24-17-24	2,092	suspended
Sheldon & Gholson, No. 1 Porterville, Tulare Co.	34-22-27	962	testing
Hayman Oil Co., No. 1 Porterville, Tulare Co.	17-23-28	380	suspended
Ellis Sanford, No. 1 Tulare Lake, Tulare Co.	20-24-23	1,490	suspended
Napa Oil Co., No. 1 Griffith, Napa Co.	7- 8- 3	3,230	sd. sh. drilling
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	5- 2-10	4,808	sd. sh. drilling
Hilderbrandt, R., No. 1 Crows Landing, Stanislaus Co.	36- 6- 7	1,130	suspended
Rushing Oil Co., No. 1 Waterford, Stanislaus Co.	20- 3-13	2,635	sd. sh. drilling
Pacific Northern Oil Co., No. 1 Guinda, Yolo Co.	23-12- 3	3,045	suspended
Easton & Monell, No. 1 Colma, San Mateo Co.	25- 3- 6	3,130	suspended
Bergman, Harry, No. 1 Dos Palos, Merced Co.	12-12-11	....	material
Los Banos Pet., No. 1 Los Banos, Merced Co.	26-10- 9	rig	suspended

HERE'S STRENGTH!

never duplicated before in a pipe wrench



IMPROVED—mightier than ever — TRIMO breaks all records, wins all tests for strength.

Give your TRIMO distributor the opportunity to prove these facts, if there is any doubt in your mind. For actual tests are proving to the complete satisfaction of the oil industry that the improved and mightier TRIMO wrench is the strongest tool of its kind ever made.

Strengthen your pipe wrench equipment with TRIMO.

TRIMO Pipe Wrench

Made for half a century by

TRIMONT MFG. CO., Roxbury (Boston), Mass.

Usual Number of Wells in Central West Fields; Seventeen Completions in Kentucky Area

By GEORGE A. WHITNEY
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Oct. 3.—The usual number of wells are reported from the various divisions of the Central West Field, although no large producers of oil are being found. The best completion in the Lima Field of northwest Ohio was drilled in by the Union Oil Co., in No. 11 on the Henry Deeds farm, Section 1, Union Township, Hancock County, which had an initial of 30 bbls. In Allen Township, also in Hancock County, the Ohio Oil Co. abandoned Nos. 6 and 8 Ephraim Troute heirs' "A" farm, Section 14, also No. 9 on the James Decker farm, Section 26, same township. B. Porter is drilling No. 4 on the Byron B. and M. Porter farm, Section 29, Liberty Township, and G. C. Comwell is drilling on the A. B. Rouston farm, Section 13, Pleasants Township, all in Hancock County.

C. A. and F. J. Peavey drilled No. 1 on the P. C. Yant farm, Section 25, Monroe Township, Allen County, which produced an initial of 12 bbls.

In Wood County, August Bushman and others abandoned Nos. 7 and 8 on the Ed Driftmyer farm, Section 12, Freedom Township, and Mary V. Conzen is drilling on the C. E. Mercer farm, Section 14, Liberty Township.

In Auglaize County, N. E. Masters is drilling a second test on the George E. Rable farm, Section 11, Noble Township, and Adrian Tester is drilling No. 3 Harry J. Hanold farm, Section 34, Moulton Township.

In Sandusky County, O'Brien and others have a flash of gas on the C. J. Rice farm, Section 17, Ballville Township, at a total depth of 1,568 feet, or 163 feet in the Trenton lime which was topped at 1,405 feet. Montgomery and others are drilling on the Frank E. Miller farm, Section 31, Rice Township. In Sandusky Township, the Ohio Oil Co. abandoned No. 8 Felix Rafferty farm, Section 7, also No. 3 B. F. Lattig farm, same section.

In the Tiffin Field, Seneca County, Flo B. Horner's second test on the A. F. Brickner farm, Section 34, Liberty Township, is a light gas well as is No. 3 on the same farm. F. W. Keiner & Foos are drilling on the G. C. Nighswander farm, Section 14, same township. J. H. Murphy & Son are drilling a second test on the Roy Knepper farm, Section 11, Hopewell Township. The Ohio Oil Co. abandoned No. 1 on the Charles B. and Ida L. Miller farm, Section 31, Pleasants Township, same county.

In Van Wert County, Anna Mueller abandoned Nos. 1, 3, 4, 5 and 7 wells on the John and Joseph Muller farm, in Jennings Township, Section 8.

In Lucas County, Monclova Township, C. M. Ross and T. D. George are drilling on the Solomon C. Betts farm, Section 8. Doblinger Brothers' test on the D. Nultz farm, Section 8, same township, is rated at 10 bbls. initially in the Trenton lime from 1,240-50 feet.

In Hardin County, Blanchard Township, Bert Sheldon is drilling on the George Schemmer farm, Section 21.

In Wyandot County, Brown and others' test on the Joseph Eckert farm, Section 20, Tymochtee Township, is a very light gas well in the Trenton from 1,355-70 feet. McPherson and others have abandoned No. 5 on the Bowman-Brillhart farm, Section 21, same township, as the well was not started to drill and had been on the location for several months. Jones & Coyle are drilling on the Margaret Brillhart farm, in Section 28, Crane Township, same county.

CENTRAL OHIO

The Central Ohio Field had a light week in completions as but five were reported, two being oil wells with an initial of 66 bbls., one dry hole and two gas wells. The best completion for oil was George Jewell and others' No. 1 on the James E. Miller farm, Section 5, Monroe Township, Guernsey County, with an initial of 58 bbls. at a depth of 3,668 feet.

The Paint Valley Oil & Gas Co.'s test on the Ralph Clinage farm, Section 20, Monroe Township, Holmes County, produced 8 bbls. the first 24 hours from the Berea sand from 692-702 feet.

Edson Sons Co.'s No. 1 on the G. P. Mong farm, Lot 56, Harrisville Township, Medina County, was dry at 390 feet.

Stewart and others' No. 4 well on the Elmer Myers farm, Section 30, Perry Township, Ashland County, proved a light gas well, and it was sold to the landowner, and the same firm is drilling No. 4 on the Herbert Austin farm, in the same section, in hopes of a larger volume of gas.

Chesmar Oil & Gas Co. drilled in a second test on the W. J. Pinkerton farm, in Fractional Section 12, Berne Township, Athens County, which is a light gas well in a stray sand at 1,039 feet. Standard Natural Gas Co. is drilling a second test on the J. N. Pickett farm, Section 12, Waterloo Township, same county. I. C. Robinson is shut down at his test on the Amy J. Lucas and others' property, Section 16, Rome Township, same county, also drilling a second test on the D. C. Dickson farm, in Fractional Section 13, Lee Township, same county.

Frank Lyons and others are drilling No. 4 on the J. H. Weaver farm, Sections 5 and 8, Fairfield Township, Tuscarawas County. Fulton and others are drilling on the Joseph Gallagher farm, Section 33, Somerset Township, Belmont

(Continued on Next Page)

Eleven Completions Reported in Eastern Area; Curtailment Is Continued in Pennsylvania

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Oct. 3.—In a notice sent out by the South Penn Oil Co. to producers connected to the lines of the South West Pennsylvania Pipe Lines in southwest Pennsylvania, the Eureka Pipe Line Co. in West Virginia and the Buckeye Pipe Line Co. in southeast Ohio, and with whom contracts exist for all oil as run, it was stated that allowable production for the month of October would be 70 per cent.

In explanation for the continued curtailment the notice stated in part: "Our company has notice that its outlet for Pennsylvania Grade oil throughout the month of October will be the same as through the month of September. Therefore, we must again ask that all our customers continue their curtailment of production throughout October in keeping with the curtailment figures asked for the month of September.

"We must again mention that since we hold standing orders for the transfer to our credit of all Pennsylvania Grade oil as run, we will be compelled to cancel these orders should we find the September production exceeding the amount asked for, or should the month of October exceed that amount." With this notice the Pennsylvania Grade crude oil industry in the East goes into its tenth month of involuntary curtailment, ranging from 15 to 30 per cent of the November, 1931, runs; involuntary since the major part of the production on these lines is purchased by the South Penn Oil Co. As a control measure, it is working equitably since, in the voluntary attempt over a year ago, many smaller operators refused to join the movement and the larger operators bore the burden.

During the past week in the three districts of the eastern fields, completions improved slightly with several fair wells being reported. A total of 11 wells was completed and one dry hole. Initial production from seven producers totaled 96½ bbls. Four were gas wells.

SOUTHEAST OHIO

In Southeast Ohio the best test for the week was the George Jewell and others well on the J. E. Miller heirs farm in the NE of Section 5, Monroe Township, Guernsey County. It was drilled in the Niagara lime at a depth of 3,670 feet and produced 60 bbls. the first day, natural. The well has not yet been shot.

Another fair well was the test of the Mid East Gas Co. and others on the L. E. Brown farm, the SW of Section 15, Reading Township, Perry County, which was brought in October 22, 1930, in the Clinton sand as a gasser. This was drilled deeper in the Clinton sand to 3,163 feet, about 17 feet lower, and is now making about 1,000,000 feet of gas a day along with about 5 bbls. of oil.

In Athens County, Robinson Brothers completed a test on the Ora Lynch farm near Albany in Section 13, Lee Township. It is a fair gas well in a shallow stray sand at 306 feet. In Holmes County the Lydic Oil & Gas Co. completed No. 3 on the Ralph Clinage farm, Lot 20, Monroe Township. It is a Berea sand well, depth 704 feet, and produced about half a barrel natural the first day, which after shot is rated good for a 1 to 2-bbl. pumper.

In Medina County, Curtis and Eaken drilled No. 6 on the Harriet Broadsword farm, Tract 16, Lot 21, Chatham Township. It went through the Berea grit to 375 feet and proved to be a dry hole.

Drilling in Ohio

Several deep wells are drilling which are now about in the sand. In Coshocton County, W. E. Stephenson is drilling No. 3 on the M. L. Noland farm, Section 20, Pike Township. In Newcastle Township of this county, the Upham Oil & Gas Co. is drilling on the D. S. Snyder farm.

In Guernsey County, E. C. Quillan and others have No. 1 drilling on the E. E. Hamilton farm in Section 10, Wheeling Township. In Rush Creek Township, Fairfield County, the Blum Oil & Gas Co. has No. 3 drilling on the J. J. McCanlish farm, Section 26. In other areas, except shallow sand territory, drilling is considerably lighter than the same period last year.

WEST VIRGINIA

A large part of West Virginia is suffering from a lack of water which retards drilling. Completions consisted of two gas wells and two producers. Both producers were small. In Ritchie County the King Knob Oil & Gas Co. drilled its second test on the A. Carpenter farm on the waters of Lambs Run in Murphy district, through the Injun sand, and to a depth of 2,181 feet. It proved dry. The well was shot in the Salt sand at a depth of 1,824 feet and will make a small producer in that formation rated about a barrel a day.

At the head of Sancho Creek in Centerville district, Tyler County, Raymond and McCullough completed No. 4 on the D. McCullough farm. It is a Cow Run sand well at 1,040 feet and will make a 2-bbl. pumper.

In Cabell County, Phillip Hager and others completed a very fair gas well on the State Hospital tract in Guyandotte district. It was drilled to 2,803 feet, the Berea sand, and is rated good for over 1,250,000 feet a day initial. In Calhoun County, Creed Barker completed a test on the Garnet E. Hershman farm in Sherman district. It is an Injun sand well at a depth of 2,350 feet and is rated as a very light gasser.

Drilling in West Virginia

In Cabell County drilling is more active than elsewhere in this State, several fair gas wells having been completed in Guyandotte and Barboursville districts in the past two months. In Barboursville district the Merritts Creek Gas Co. has spudded in and started drilling on the William Riggs farm and is down about 400 feet. In the same section, T. M. King, trustee, has reached 1,480 feet on the Barboursville Clay Products Co. property. In Guyandotte district, C. C. Wolfe is down 2,196 feet on the C. H. Freeman farm and is fishing for tools and cleaning out in his No. 4 on the Ben Lomond Land Co. lease which has reached 2,983 feet. The Midway City Gas Co. has its No. 2 on the O. C. Morrow down to a depth of 1,350 feet and are at present fishing for the bailer.

In Loncoln County, C. McGhee and others have reached 1,520 feet on the A. L. Mullens farm in Jefferson district. R. H. Adkins and others have had to shut down for water at 1,125 feet on the J. O. Elkins heirs farm in the same district. In Union district the Woodall Gas Co. has reached 2,285 feet in No. 3 on

the James W. Adkins farm and is holding a location for No. 4 on the James R. Adkins farm. R. H. Adkins and others are down 850 feet in a second test on the Gloza Bragg farm, Union district. In the same section the Harvard Gas Co. has made a location for No. 3 on the Standard Fuel Gas Co. property.

In Wetzel County, Null and Morehead have made fair progress in their No. 5 on the W. G. Snodgrass farm in Church district, having reached 2,885 feet. In the same district the State Line Oil & Gas Co. remains shut down at 1,350 feet waiting on water on the Emma M. Kirkhart farm.

In Doddridge County the Columbian Carbon Co. is drilling No. 62 on the Lewis Maxwell farm in West Union district. It is about 350 feet deep. In Grant district, Riley Yeater is drilling his second test on the W. W. Spencer farm and has reached 900 feet.

In Wirt County the Roberts Brothers are down 1,200 feet on the Hall and Ackley farm in Burning Springs district. In Clay district, Baker and Brian are fishing at 700 feet on the D. P. Higgins farm. In Gilmer County, A. E. Ellis and others, successors to Frank Golden and others have passed the 1,600-foot mark on the H. E. Engle farm, DeKalb district.

SOUTHWEST PENNSYLVANIA

Three producers were completed in Southwest Pennsylvania, one quite fair. In the small pool opened up by O. Miller on the P. J. Shrum farm in McCandless Township, Allegheny County, back of West View, several wells are drilling. Close to the Shrum, O. Miller completed a test on the Samuel Noving farm in the 100-foot sand, which came in making about 40 bbls. a day natural. At present the well is flowing at the rate of about 25 bbls. a day. On the other side, Brooker & Co. completed a test on the Guyer farm in the same formation and has a well showing for about 3 bbls. a day. These operators have a rig standing for a second test on this farm. Hardt and others have built a rig for a second test on the Noving farm.

In Butler County and Adams Township, R. S. Steen & Co. completed a test on the J. C. Kelley farm in the 100-foot sand at a depth of 1,498 feet. It is showing for 5 bbls. a day initial.

In Allegheny County, W. I. Gettmand & Co. are drilling on the Peter Hess farm in Fawn Township, and have reached a depth of 1,750 feet. In South Franklin Township, the Reilley Oil Co. is down 1,550 feet on the Reilley heirs' farm.

In Greene County, James H. Null is rigging up for a second test on the Elizabeth Rice farm in Springhill Township. In Center Township the Duquesne Gas Co. is drilling on the G. M. and W. H. Scott farm. In Springhill Township the Dunkard Valley Oil & Gas Co. has shut down at 3,360 feet in drilling its old No. 1 on the Harry Lemons farm deeper.

Wildcats

In Southeast Ohio the deep test of E. E. Grimm and others on the E. E. Knowlton farm in Section 10, Independence Township, Washington County, remains shut down waiting on rigging for the new rig. Drilling is expected to be resumed this week.

In Virginia the Benedum & Trees test on the I. Kaufman farm in Wise County has reached about 2,100 feet. In Russell County their test on the Clinchfield Coal Co. tract is down about 2,300 feet and drilling.

In West Virginia the deep test of Benedum & Trees on the Pocohontas Coal Co. tract in Big Creek district, McDowell County, has reached about 5,300 feet and is at present shut down.

Central West Fields

(Continued from Preceding Page)

County. H. D. Crouch and others are drilling on the Boyd & Myers farm, Section 26, Kirkwood Township, same county. The O. K. Oil & Gas Co. is drilling No. 2 Alice M. Adams farm, Section 29, Union Township. Shay McMullen Co. has a rig on the Orrin Lucas, Section 28, Warren Township, same county, and the Union Gasoline & Oil Corp. has a rig on the John Loahary farm, Section 25, Richland Township, same county.

INDIANA

The finding of excellent oil producers in the extreme southwestern part of Indiana, in Vanderburg County, at compartively shallow depths the past couple of weeks has brought about a new field for development in that part of the State. The best completion so far reported was John L. Drake and others' No. 2 on the John and Mary Effinger farm, NW, Section 33, Center Township, which produced an initial of 100 bbls. from 883-995 feet, and No. 3 is reported drilling. No. 3 on the County Poor farm, in the same quarter section, is reported drilling, and R. J. Randall is also reported drilling No. 3 Theodore Kinder farm, same section.

Indiana Southwestern Gas Corp. reports a 25-bbl. initial producer on the Jennie Cassidy farm, Section 32, Clay Township, Pike County. Same company is drilling on the Tom Stone farm, Section 16, Washington Township, same county, and Vern Burdin is drilling on the W. Smith farm, same section.

Siosi Oil Co. is reported shut down at 2,114 feet in No. 21 on the William Riggs farm, Section 32, Prairie Creek Township, Vigo County. C. C. Taliaferru, Jr., is reported shut down at 2,460 feet on the R. T. Rynerson farm, Section 21, same township, and is drilling No. 1 on the Cyrus L. Lane farm, same township.

In Sullivan County, Haddon Township, Parker & Heinds are shut down at 228 feet on the Johnson-Prather farm, NW, Section 10. Scott, Whitlock and others are reported around 1,225 feet at a second test on the T. and K. Metzker farm, SE, Section 24, Turman Township.

ILLINOIS

Only one completion was reported from the Illinois fields, being Roger Dill and others' test on the H. Brown farm, Section 6, Prairie Township, Crawford County, which was a dry hole. Warner Brothers are drilling on the Grant Jessup farm, Section 23, Honey Creek Township, same county, and Frank Allison and others are drilling on the Abe Pleasant farm, in the NW, Section 36, Robinson Township, same county.

In Lawrence County, the Big Four Oil & Gas Co. abandoned No. 14 on the E. J. Sneed farm, Section 16, Lawrence Township, and in Bridgeport Township, same county, the Ohio Oil Co. abandoned Nos. 5 and 6 Altha Griggs No. 1 farm, Section 18.

In Wabash County, J. W. Whiteside Co. abandoned Nos. 1 and 3 on the Howard Armstrong farm, Section 24, Wabash Township, and drilling No. 5 on the same farm.

Bond County Gas Co. is drilling on the Dowis farm, Section 29, Lagrange Township, Bond County, and on the Ayers anticline, 5 miles north of Greenville and nearly a mile east of the drilling well on the E. M. Gullick farm, which is Section 30, and which is being drilled by L. A. Painter and others.

KENTUCKY

With 17 completed wells scattered over several counties, Kentucky is showing more activity than for a long period. No large producers were reported, but that does not discourage the average operator who is glad to get a commercial well.

In Ohio County, the B. & B. Oil Co.'s No. 5, on the James Greer farm, in the Whittaker Pool, produced 35 bbls. initially at a depth of 599 feet, and D. T. Bolling and others' No. 1 I. T. Westerfield farm, in the Deanfield Pool, same county, produced 10 bbls. under pump in 24 hours.

In Daviess County, Brewer & Thrasher's test in the northwest corner of the Sam Hagan farm, 1 mile east of the Jones Pool, was a dry hole at 650 feet. Ellis & Ashby's test, 200 feet from the south line and 600 feet from the west line of the Chester Taylor farm, in the Jones Pool, is a dry hole at 620 feet. George C. Staves and others are drilling on the Martin Weaver farm. Newton Ross and others are drilling No. 1 John Trunell farm.

In McLean County, the Ohio Oil Co.'s No. 4 well, 1,600 feet from the south line and 225 feet from the east line of the G. B. McMananna account 2 farm, in the Calhoun Pool, produced 5 bbls. from a depth of 211 feet. No. 5, same farm, is drilling. McLean Development Co. is drilling No. 3 on the G. B. McManama 150-acre farm, in the same pool. William Collins is drilling No. 1 on the Charles Martin farm. H. A. Osborne and others are drilling on the Frank Bennett farm; Otto Nethers and others are drilling No. 2 Fannie Foley farm, and the First Owensboro Bank & Trust Co. is drilling No. 2 on the Will Ashton farm, also in the Calhoun Pool, same county.

In Hancock County, Bolling & White's No. 4 on the Preston Mathews 130 acres, an offset to the Richard School lot well, produced 30 bbls. initially. Hupp & Duff's No. 4 well, 150 feet from the south line and 400 feet from the west line of the Elec Jackson farm, in the Richards Hill area, is reported with an initial of 8 bbls. H. C. Smith drilled a dry hole in No. 1 on the John Smith farm. D. T. Bolling and others found a dry hole in the southwest corner of the Fred Morris farm, 4 miles east of Pellville.

In Hart County, Beville & Gardenhire's test on the I. H. Wintock farm, is estimated with an initial of 25 bbls. Hupp & Duff's No. 16 on the W. T. Spencer farm, in the Logsdon Valley, is reported with 60 bbls. initial, as was No. 17 on the Grover Jaggers farm, in the same valley.

Two gas wells were reported in Christian County, one on the Frank Clark farm, and the other on the Amos Kester farm.

The Himyar gas field, in the Barboursville Pool, in Knox County, reports a nice gas well drilled by the Letmer Oil & Gas Co., in a second test.

In Pike County, the West Virginia-Kentucky Gas Co.'s No. 1 on Bear Fork of Robinson Creek, is a gas well, and the United Mineral Development Co.'s No. 1 on Robinson Creek, same county, is also a gas well.

In the Niagara Field of Henderson County, the Imperial Oil & Gas Products Co.'s No. 4 on the S. A. Freeman farm, produced an initial of 46 bbls. Turner & Tichnor are cleaning out two wells, in the same field, No. 1 Chester Duncan farm and No. 1 on the Mrs. Mollie Duncan farm.

The Ohio Oil Co. has a rig on the Frank Locke farm, in the Greenville Field, in Muhlenberg County.

How Much Does a Tank Vent Cost?

—if it is not gas tight
—if it gets plugged up
—if it is too small
—if the valves stick
—if the valves corrode?

Be Safe—
Use
OCECO
Vent Valves

equipped with gas-tight valve seats. They effect largest possible vapor savings. Valves and seats of high purity corrosion-resisting aluminum. Full area passages. Thousands in use.

For recommendations, write

THE
OIL CONSERVATION
ENGINEERING CO.
877 Addison Rd. Cleveland, Ohio

PATENTS *Write for Free Book*
MUNN & CO.
Associated since 1846 with the Scientific American
514 Scientific American Bldg., Washington, D. C.
1551 Scientific American Building,
24 West 40th Street, New York City
1203 Tower Building, Chicago, Ill.
686 Hobart Building, San Francisco, Calif.
311 Van Nuys Bldg., Los Angeles, Calif.

BURRELL-MASE ENGINEERING CO.,
Design, Construction, Valuation, Tests, Reports.
Law and Finance Bldg.
PITTSBURGH, PA.

Crude Oil

Have market for Fuel which could use certain types Crude. Give all details in first letter. Address Box F360.

C. M. HEETER, SONS & CO., INC.
MAIN OFFICE AND WORKS, BUTLER, PA.

"Heeter's" Packers and Swabs

Heeter's Improved Patent Swabs, Corrugated Friction Sockets, Wire Line Pumping Outfits, Sand Pumps and other Gas and Oil Well Materials

Three Good Producers and Four Dry Holes Are Reported in the Zwolle District, Louisiana

By J. R. CRUMPTON
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Oct. 3.—The Zwolle Field in Sabine Parish reported three good producers completed during the last seven-day period to offset an otherwise dull and uninteresting week throughout this division. This field also reported two wells, completed a few weeks ago flowing less than 100 bbls. daily, with considerable increased production when put on the beam. The two wildcats that have been in the spotlight in the North Louisiana district for the past 10 days failed to develop anything further during the past week. One of them found the plug a few hundred feet from the top when the crew went into the hole to drill it out, and the other has a bad casing seat and various troubles with the perforated liner at the bottom of the hole.

Two of the Zwolle completions were of the gusher type. W. F. Lacy's No. 4 McNeely, Section 14-7-11, is flowing 1,500 bbls. daily through one-fourth inch choke from a total depth of 2,606 feet. The top of the marl in this well was encountered at 2,450 feet and the top of the chalk at 2,495 feet. About one-half mile southeast of this well, in Section 13-7-11, W. C. Turnbow's (formerly O. J. Rowe) No. 2-B Williams is flowing 500 bbls. daily through 2-inch tubing with the bit at the bottom of the hole. The total depth is 2,536 feet, considerably higher than the Lacy well, and is estimated to be good for an open flow of 2,000 bbls. daily. Both of these wells are on the southeastern flank of the field, north of the town of Many. The other completion in this area was E. F. Neely's No. 2 Ponder, Section 9-7-11, flowing 100 bbls. daily from 2,490 feet. Scully & Beach's No. 2 Lafitte, Section 13-7-11, completed a few weeks ago flowing 250 bbls. daily from 2,486 feet, was put on the beam and is pumping 400 bbls. daily. A well on the northeastern flank, J. H. Askew's No. 1 Henderson, Section 31-8-10, increased its production to 125 bbls. daily when put on the pump.

The North Louisiana district also furnished one more oil well and one gas well from widely separated areas, along with four dry holes from the Zwolle Field. In the Dixie area of Caddo Parish, the D. C. R. Oil Co.'s No. 1 Caddo School Board, Section 16-19-14, is flowing 75 bbls. daily through 2-inch tubing, set with packer, from 2,449 feet. The pay is coming from 36 feet of broken sand from 2,413 feet to the total depth. In Richland Parish, the Pelican Natural Gas Co.'s No. 1 James Noe, Section 14-17-5e, had an initial flow of 15,000,000 feet of dry gas with 1,065 pounds rock pressure from 2,353 feet. The well blew in while drilling under 6-inch casing set at 2,300 feet, and would have a greater initial flow if deepened further into the pay. It is an extension of the proven area of the Richland Field, three-fourths of a mile west and about one-fourth mile north of previous production. The four dry holes in the Zwolle Field follow: S. A. Lane and others' No. 1 DeKeyser, Section 23-7-11, depth 2,930 feet; the Skidmore Oil Co.'s No. 1 G. Martinez, Section 3-7-13, an offset to some good producers on the western flank, dry at 2,463 feet; The Texas Company's No. 4 Stille, Section 33-8-11, total depth 2,650 feet; W. C. Turnbow's No. 4 Williams, Section 13-7-11, dry at a total depth of 2,632 feet.

Gibson & Johnson's No. 1 Frost Lumber Co., Section 19-9-13, in the Converse area northwest of the Zwolle Field, failed to make a test during the past week. Six-inch casing was set on top of the marl at 1,548 feet, for a test of a good show from the Saratoga chalk at 1,624 feet, but the plug was found to be only 300 feet from the top when drilled out, and after getting returns from the bottom, the 8¼-inch casing was reset at the same depth. The plug is being drilled at this writing, and the interested operators of that area confidently expect to open up another chalk rock producing field, at a shallower depth and more consistent than Zwolle. The C.M.F. Oil Co.'s (formerly Flinchbaugh & Myers) No. 1 Aaron, Section 32-9-13, 2 miles south of the Gibson & Johnson test, has passed up the chalk rock show and will drill to the sand at 3,120 feet, cored from the Keen abandoned and junked well about one-fourth mile to the west. The C.M.F. Oil Co. topped the marl at 1,580 feet, the Saratoga chalk at 1,664 feet, the Annona chalk at 1,883 feet and is drilling at 2,230 feet. The indications are that the new Converse structure will get a good play. Three miles east of the above mentioned tests, Cloud & Bowlin have spudded in their No. 1 Bowman-Hicks in Section 26-9-13. This test is between the Converse area and the Spring Ridge Field, uncovered last year by one oil well and one gas well drilled by the Pugh & Hickman, the Langbridge Oil Co. and Frank Foster, Inc. It is reliably reported that more operations will be started soon in the Spring Ridge area, which is about 5 miles south of the Pleasant Hill Field.

The DeSoto Parish test, south of Mansfield, Walters & Nicholson's No. 1 Guy, Section 3-11-13, made two heads of oil while swabbing during the last week. The 6-inch casing had a bad seat, allowing fresh water from above to come in, and the crew is also cleaning off paraffin from second hand tubing in the hole. In the northern part of DeSoto Parish, Potter & Tracewell's (formerly S. A. Guy) No. 1 Dowling, Section 31-14-14, is reported to have cored 1 foot of oil sand from a total depth of 3,068 feet. The well has made no further test during the last five days, having been shut down for water. In the northwestern part of Bossier Parish, 7 miles west of Plain Dealing, Braezelle & Steckall's No. 1 Nattin, Section 15-22-14, cored oil sand from 2,940-42 feet. The hole was deepened to 2,985 feet, and a drill stem test of the 2 feet of sand above developed only 3 or 4 gallons of oil. The hole was then deepened, encountering 10 feet of red gumbo and streaks of oil sand below. No test has been made of the latter sand with the bottom of the hole at 3,018 feet. The well is one-fourth mile north of the Plain Dealing Oil Corp.'s No. 1 Nattin in the same section, completed about a year ago as a 10-bbl. pumper from 2,890 feet. The logs of the two wells reveal that the present test is checking 52 feet lower to the pay sand than the original test in that area.

The South-Central Louisiana area, composed of the parishes of Vernon, Beauregard, Rapides and Avoyelles, loom as a possible active area as the result of the Republic Production Co. and the Houston Oil Co.'s No. 1 fee, Adolph Sterne Survey, in Tyler County, Texas. There has been extensive geophysical and magnetometer surveys in progress in these parishes during the past few months, and the Tyler County, Texas, well, only about 20 miles from the Louisiana line, which developed an estimated 30,000,000 feet of saturated gas on drill stem test from 10 feet of sand from 4,696 to 4,708 feet, is expected to add to the activity of this area. The play is based on the supposition that that territory is on the Jackson-Conroe trend, extending from the Conroe Field in Texas north of Houston to the Jackson gas field in Hinds and Rankin Counties in Mississippi. Many geologists and operators have contended that there is salt dome production between the coastal domes of South Louisiana and Texas and the interior domes, and the results of the Tyler County test bear out this theory.

ARKANSAS

The gas district in Franklin County furnished one of the successful completions for the week. The Ozark Natural Gas Co.'s No. 1 Monroe, Section 13-8-29, had an estimated initial flow of 3,000,000 feet with 490 pounds rock pressure from 2,380 feet. The gas sand was logged from 2,330 feet. None of the wildcats in this state was tested during the week, or encountered anything of interest while drilling.

MISSISSIPPI

The Hinds County area of the Jackson Field reported one completion. Atkins and others' No. 1 Crane Lawrence, Section 23-6n-1e, had an estimated initial flow of 10,000,000 feet of dry gas from a total depth of 2,496 feet.

An important announcement of interest to present and future operators in this state was published during the last few days. The first set of rules and regulations adopted by the State Oil & Gas Board of Mississippi, the new minerals conservation department created last May by the state legislature, has been, promulgated and put into effect. The order covers the usual state regulations of obtaining permit to drill and of keeping and turning in to the state oil and gas supervisor accurate logs on all wells drilled. It is definitely stated that notice shall be given to the state oil and gas supervisor of the approximate hour at which any casing that requires cementing shall be run, and the running of the casing shall not begin until after the arrival of the supervisor or his representative.

In the Jackson gas area, a second string of casing, or subsurface below the usual surface casing, must be set and cemented with not less than 25 sacks of cement, below the Sparta sand in the shale or gumbo of the Cane River formation. This subsurface casing will require about 700 feet of 10 or 8-inch casing. It is also stated that in the Jackson Field when 6⅝-inch casing is to be used for the final string above the gas pay, that if it is new, seamless and weighs 20 pounds or more per foot, it may be run without testing; otherwise the casing must be tested in the presence of a representative of the Oil and Gas Board. It is also ordered that this final string of casing shall be cemented with not less than 100 sacks of unadulterated cement.

Notice of intention to abandon a well must be given in writing to the State Oil and Gas Board in time for a representative to be present on the well to prescribe the materials to be used in plugging and the manner of doing the work. The other regulations cover the powers and authority of the State Oil and Gas Board to stop operations when said operations have been or are being carried on in violation of the provisions of the Conservation Act. The board also reserves the authority to refuse a permit to drill to any operator who, in the judgment of the supervisor, has on occasion knowingly evaded or sought to evade any of the provisions of the Conservation Act.

Daily Average Runs

The fields of North Louisiana and Arkansas netted an increase of 750 bbls. daily in the average runs for the past week. Due to a number of good wells in Zwolle, North Louisiana exceeded 30,000 bbls. daily for the first time in 18 months. The Stephens Field in Arkansas receded to 50 bbls. daily from 300 bbls. the week before, but this was offset by an increase of the Urbana Field which reached a high peak for the past two years with a daily average run of 1,650 bbls. The daily average runs from the several pools were:

NORTH LOUISIANA

	Bbls.
Caddo light	5,160
Caddo heavy	1,900
Cotton Valley	700
DeSoto and Red River	1,860
Elm Grove	415
Haynesville	4,220
Holly	260
Homer	2,800
Pleasant Hill	260
Sarepta-Carterville	825
Urania	3,750
Zwolle	7,950
Total	30,100
Total previous week	29,720
Increase	380

ARKANSAS

Champagnolle	1,720
El Dorado	3,010
Lisbon	460
Nevada	955
Smackover light	2,890
Smackover heavy	23,660
Stephens	50
Urbana	1,650
Total	34,395
Total previous week	34,025
Increase	370
Total both states	64,495
Total previous week	63,745
Increase	750

Wildcat Operations in Louisiana-Arkansas

(Rotary operations unless otherwise designated)

North Louisiana

AVOYELLES PARISH

Company, well, farm name, section and block— Remarks:

T. J. Woodley, tr.'s No. 1 Thompson & Koltz, 2,640 ft. E, 200 ft. S, NW cor., Sec. 11-2n-5e..... Drlg. 150 ft.

BEAUREGARD PARISH

DeRidder Development Co.'s No. 1 McMahan, 158 ft. S, 160 ft. W NE cor. NW, Sec. 33-2s-9w..... S.D. 1,265 ft.

BOSSIER PARISH

Breazelle & Steckoll's No. 1 Nattin, C SW NE, Sec. 15-22-14..... S.D. 2,985 ft.

CADDO PARISH

Caddo-Prairie Dev. Co.'s No. 1 Nichols, 660 ft. N, 400 ft. E, SW cor. NE SW, Sec. 10-22-15..... Location.

Louana O. & G. Co.'s No. 2 Cushman, 250 ft. N and E, SW cor., Sec. 33-19-16..... Set 6-in. 2,740 ft.

(Continued on Page 91)

North Government Wells Pool Extended North; Important Test Coring in the Tuleta District

By B. D. STEVENSON
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Oct. 3.—Highland Oil Co.'s No. 1 Lundvall, in the north end of the North Government Wells Pool, reported last week as looking like a well, came in for an estimated 200 bbls. daily, as a very conservative estimate. It topped the sand at 2,235 feet, instead of 2,245 feet, as reported last week and with elevation of 150 feet got the sand about the highest of any well in the field. A few days before the Hamill & Hamill No. 1 Hahl had extended the field more than a quarter mile north and the Highland Oil Co. test is exactly a quarter mile north of the Hamill & Hamill well.

While the depth of the well and elevation considered leads many to believe it is in the upper of the two lower horizon sands there are some reasons to believe that it is in the regular lower sand producing in the most of the wells of the field, and that the upper sand lenses out to the north of the field. The Cole sand at around 1,565 feet is found in all the wells and came in gas in the Seacord & Putnman No. 1 Johnson which was afterward deepened. There are two other sands, one found in most wells a little above 2,300 feet and the other a little below that are meant as upper and lower sands.

Whatever sand the well is producing in it is an important extension to the north and if producing in the upper sand opens some additional possibilities for the field.

A new wildcat is being started by Buchanan & Tyrrell in Survey No. 96, a little over 2 miles north of the North Government Wells Pool, that is near enough to the field to create considerable interest in connection with the field and the understanding is that still other deals are being worked up for the north part of Duval County.

Saxet Field in Nueces

Houston Oil Co.'s No. 2-A Harrell at 4,408 feet in a sand evidently not producing in any other well in the field, came in for a big volume of gas and about 150 bbls. of oil daily on three-sixteenths-inch choke. It is in the north central part of the field. The amount of gas production is so large that unless it can be run through separator, there may be difficulty in producing the well.

Also the past week Romanix Oil Co. (McCarthy and others) No. 1 Isencee on the west end of the field, at 4,550 feet, and 2 miles southwest of the group of producers in that horizon, came in for a big volume of gas and spraying a little oil. The Saxet Field has a multitude of sands most of them mainly if not entirely gas and the oil production is coming almost entirely from wells in the sand at 4,100 feet. Production in the field which recently went up to 2,000 bbls. daily has dropped back to 1,600 bbls. daily.

Bee County

J. Stanley Smith's No. 1 Weiss, 2 miles northeast of the Tuleta Field in Bee County, cored a sand at 4,208-27 feet but the drill stem test failed to show evidence of a commercial well and it is coring deeper. It is at about the depth where it should pick up the sand producing in the Tuleta Field but still has some leeway and can deepen a little more without losing the possibility of being a well.

This well is counted on to give the Tuleta Field a new start in life and this week will probably tell whether or not it will.

In the field, O'Neil and C.R.&M. topped the sand at 4,096 feet located about 300 feet southeast of the discovery well and drill stem test which was not a very satisfactory test indicated nevertheless that it would make a good well.

Other than this the only test in the field is the Nichols and C.R.&M. No. 2 Harris, carried by some as No. 3 Harris, but a west offset to the Coquat & Hawn No. 1 Harris and located about 1,000 feet south and 660 feet west of the discovery well which got the sand at 4,091 feet, which is about the same as in the Coquat & Hawn well and a drill stem test indicates it will make some kind of a well. This new field as yet consists of the discovery well and the Coquat & Hawn No. 1 Harris each making oil and considerable gas and The Texas Company No. 1 Cox west offset to the discovery well a gas well.

New interest is being created in Goliad and Karnes Counties. Some independents are to drill in southern Karnes on a big company block and in Goliad, Slick, Seeligson, Inc., have made location for No. 2 Poetter in the Slick Pool about 1,200 feet southwest of the No. 1 Poetter which is the discovery well of the field and producing in the Pettus sand.

The same operators have spudded in their No. 1 Kauffman at Hord's Creek near the F. P. Zoch discovery well and about 10 miles northeast of the Pettus Field. The Zoch well came in more than a year ago but no development work has been attempted around it since till the new test was started by Slick-Seeligson. Zoch's well was a big gas well but making considerable oil also.

Ordovician Test

E. A. Parkford's No. 1 Duke, location for which has been announced in western Bandera County near Vanderpool and near the Wood-Texas No. 1 Clayton, drilled years ago, is not to stop with the Pennsylvania, unless it gets production in that formation but is to be an Ordovician test, which creates more interest in the new wildcat which is expected to get spudded in within the next two or three weeks. It is located several miles southeast of the Evans & Gant No. 1 Love in Kerr County which had considerable oil in three horizons.

The Parkford test should top the Pennsylvania at less than 1,380 feet where it was topped in Kerr and is expected to go out of the Pennsylvania at around 5,300 to 5,400 feet. The contract depth is 4,000 feet and this led to the idea first that it would test only the Pensylvania, but the plans of the operator call for exploring much deeper than the contract calls for.

Wet rainy weather and muddy roads and fields have held this deal up along with many others over Southwest Texas. This rainy weather has been bothering off and on for two months or more.

Deep Wildcats Planned

Two additional deep wildcat tests were announced the past week. Teas & Gant made location 4 miles southwest of Smithville for the No. 1 Mikulec in the William Barton Survey, to be an Edwards lime 50 feet into the Edwards or 7,000 feet. A major company has agreed to take acreage and pay considerable bottom hole money on the deal.

Another test to the Edwards or 5,000 feet is to be drilled by Kirby Petroleum Co. and others of Houston in Gonzales County on the Lum & Boulder fee land in the Russell Ward Survey which is in the neighborhood of Ottine and several miles southeast of the Salt Flats in Caldwell County.

Serpentine possibilities have engaged the Balcones fault zone considerable of late. The R. R. Ogden No. 1 Riddle in southern Bastrop has probably opened up a nice little Serpentine field. The well is making about 100 bbls. daily and several other tests are to be drilled soon in the same area by the same operator.

In northern Bastrop County, Marts & Beavens' No. 1 Sloop found Serpentine at 1,868-1,924 feet but found it dry. It does, however, locate another Serpentine body which may be productive. It is near Elgin.

In Milam County, the Moore and others No. 1 Camp reported to be in Serpentine at 1,024 feet was in broken Taylor and chalk and Serpentine at 1,070 feet and drilling. It showed some oil in the Serpentine and will lead to the drilling of other tests in that vicinity in the hope of finding the plug. It is in western Milam County.

Two Balcones wildcats late in the week were attracting a little interest. The H. A. Suttle No. 1 Halm in Guadalupe northeast of Seguin at 1,785 feet had not topped the chalk which was topped at 1,622 feet in a test 500 feet east of it and it was thought it would cut the fault and get the Edwards high on the upthrow side. If it cuts the fault it would do it in the next day or two. This test is northwest of the Sal-Mar Field in Guadalupe.

The other test is the J. T. Stover No. 1 Hoffman about 1 mile or more southwest of the Sal-Mar Field and in the general line of trend which at 1,775 feet was thought to be in the basal Taylor. If so it would be running about 200 feet high. The next day or two drilling will tell the verdict.

Duval County

Delange and Frates' No. 1 Sevier in northeastern Duval County got the Cole sand at 2,633-58 feet but dry. It is topped at around 1,550 feet in the North Government Wells Field and with an interval of about 750 feet between it and the producing sands below, hence the No. 1 Sevier with another week drilling should reach this sand.

Gas from the water well producing in the Oakville at about 225 feet caught fire the other day and caused trouble for a time till it was smothered by burying the fittings on the well with sand. It is a short distance from the No. 1 Hoffman.

Developing Rosenburg Area

Hamill & Hamill have taken over an interest in Webb County in the lease of the southwest quarter of Survey No. 23 of which Sarah Lloyd is the fee owner, the survey being next north of Survey No. 271 in which the Laurel Pool is located discovered by Phil Rosenburg. The interest was secured from Clifton E. Wolcott and associates (Rehmet & Wolcott) and is for development purposes and the first test will be staked out soon. This is the first close-in test to be started since the discovery of the field and is the closest outside acreage to the discovery well and the group of several producers around it.

Wildcat Operations in Southwest Texas

Week Ending October 1

Company, farm and location—	Remarks:
ATASCOSA COUNTY	
American Central Oil Co.'s No. 2 Mary McConnell, 150 ft. W of E line, 300 ft. S of No. 1, Blk. 138, W. C. M. Baker Sur., 3 miles W and 6 miles S from Somerset	T.D. 1,660 ft.; rig moved off.
E. A. Parkford et al's No. 1 McCowen-Dickinson, Campbell-Berry Sur.	T.D. 1,060 ft.; abnd.
G. W. Partee's No. 1 McCowan on intersection of Sections Nos. 38, 39, 48 and 49 of Subd. of Houlihan Sur.	T.D. 642 ft.; drlg.
BANDERA COUNTY	
F. A. Brown's No. 1 R. B. Watson, 600 ft. N of cen. of S line of Sec. 71	T.D. 330 ft.; drlg.
E. A. Parkford's No. 1 Duke in NW cor. of Sec. 7, G.C.&S.F. Sur.	Location.
BASTROP COUNTY	
Marts & Beavens' No. 1 A. Neidig, 150 ft. from E line, 525 ft. from N line of tract in J. Burleson Sur.	T.D. 2,165 ft.; abnd.
Marts & Beavens' No. 1 Sloop, 150 ft. from W line, 900 ft. from S line of tract in J. Burleson Sur.	T.D. 1,924 ft.; drlg. top chalk.
Parsons & Mayfields' No. 1 Carroll, N of town of Bastrop	T.D. 2,378 ft.; pumped 15 bbls.
Properties Trading Co.'s No. 1 Henry Freitag, 400 ft. from SE line, 1,800 ft. from NE line of F. Conley Sur.	T.D. 2,070 ft.; S.D.
R. R. Ogden's No. 1 Riddle, 350 ft. from E line, 750 ft. from N line of 94.5-ac. tract in Joshua Gray Sur.	T.D. 2,223 ft.; 90 bbls. daily by heads.
Teas and Gant's No. 1 Mikulec, 330 ft. to NW and SW lines of tract in Wm. Barton Sur.	Contract for 7,000-ft. test into Edwards. Derrick up.
BEE COUNTY	
Fitzgerald & Pryer's No. 1 Albert Johnson in M. Alcarte Sur.	Rigged up and S.D.
Nichols & Bruner's No. 1 Grover Heidenfels in John Bryan Sur., 891 ft. from S line, 1,950 ft. from E line of tract	T.D. 1,400 ft.; drlg.
J. Stanley Smith's No. 1 Weiss, 3,096 ft. E of E line of Sec. 1, Ragsley Subd., and 290 ft. from N line of Uranga grant	T.D. 4,227 ft.; top sand 4,208 ft.; making drill stem test.
BELL COUNTY	
Alex Krause' No. 1 W. P. Edds, 650 ft. from S line, 150 ft. from W line of 100-acre tract in M. Moreno Sur.	T.D. 712 ft.; S.D.
James Scoggins' No. 2 Warrick, Ingram Sur.	T.D. 1,432 ft.; cleaning out.
BEXAR COUNTY	
Amsden-Ingersoll-Miller's No. 1 Strumberg, 450 ft. to W line, 1,020 ft. to N line of tract, 12 miles SW of San Antonio	T.D. 1,054 ft.; standing.

(Continued on Page 90)

Cut Bank District Is Busiest in Montana District; Rangely Dome Outstanding in Colorado

By TOLBERT R. INGRAM
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Oct. 3.—One completion, a 10-bbl. pumper in the Artesia district, was the only development outside of routine progress in New Mexico. In Colorado, the California Co.'s Rangely Dome test is reported 200 feet into the pay and will stop at 6,200 feet to determine the capacity of the well. The Ohio Oil Co.'s No. 1 Butters, northeast of the Greasewood Pool, is drilling deeper after the Muddy failed to offer any encouragement for production. The Ramsey test in the Buckingham-New Raymer district is running high. No completions were reported in Colorado.

In Wyoming, one completion, a 50-bbl. well, and one location were reported in the Osage Field. Sidney H. Keoughan and associates are starting a well for gas on the Dutton Creek Dome. The government has placed Oregon Basin on a competitive price basis with other black oils in the Big Horn Basin.

In Montana, the principal activity is centered in the Cut Bank district in Glacier County, where 12 operations are now under way, including two new locations. One dry hole was completed in the Kevin-Sunburst Field and a 100-bbl. well was completed in the Border Field by the Askalta Oil Co.

In Oregon, a deal made with Los Angeles parties provides for completion of the Coquille wildcat and the drilling of two more wells.

NEW MEXICO

Lea County

Routine progress in drilling wells in the Hobbs Pool were the only developments of the week. Five operations are under way, of which all are inside wells.

Midwest Refining Co.'s No. 11 Byers, C NE NW Section 3-19-38, in the southern part of the pool, is bottomed at 1,633 feet and is redrilling at 1,400 feet to straighten hole after cementing back. Gypsy Oil Co.'s No. 2 Grimes (East), C SE NE Section 33-18-38, is bottomed at 221 feet. The 13⅜-inch was cemented at 218 feet with 175 sacks. Skelly Oil Co.'s No. 1 McKinley, SW NW NW Section 20-18-38, is drilling at 2,600 feet in salt. Shell Petroleum Corp.'s No. 3-B McKinley, SW cor. Section 20-18-38, has rigged up rotary and is ready to spud. Humble Oil & Refining Co.'s No. 1-B Bowers, NW cor. Section 29-18-38, has rigged up rotary and is ready to spud.

In the Lea area, The Texas Company's No. 1-B Lynch, C SW NW Section 34-20-34, is drilling at 638 feet in the red beds. The 15½-inch was cemented at 643 feet. Same company's No. 3-A State, C Lot 2, Section 2-21-33, is drilling at 3,730 feet in white lime. It had rainbows of oil at 3,656-60 feet.

In the Eunice area, Tidal Oil Co.'s No. 1 State, C SW NE Section 8-21-36, is still shut in at 3,985 feet, total depth, waiting for storage tanks to be emptied to make a test. It is estimated good for 500 bbls. of oil per day. It showed considerable water with the oil.

In the Lovington area, Western Drilling Co.'s No. 1 State, NE cor. SE Section 13-17-36, is drilling at 2,015 feet in anhydrite.

Eddy County

Flynn, Welch & Yates' No. 63 State, SE cor. NW Section 10-19-28, southeast of the Artesia Pool, was temporarily completed at 2,718 feet for 10 bbls. per day. Top of pay was at 2,085 feet. It is a diagonal offset on the northwest to same firm's No. 62 State which pumped 25 bbls. per day initial at a total depth of 2,153 feet. No. 63 may run a string of 6¼-inch and drill deeper.

Finley, Woods & Brainard's No. 5 Brainard, C NW SW Section 5-18-27, is drilling at 440 feet in gypsum and anhydrite. It had some water at 275 and 425 feet, amounting to about 10 bailers per hour. W. A. Scott's No. 1 Kaiser, NW NE Section 7-18-27, is shut down at 1,259 feet on account of rain. Leonard & Levers' No. 8 State, C SE Section 21-17-29, Jackson district, is drilling at 1,655 feet in anhydrite, and R. Spearow and others' No. 1 McClellan, SW NW NE Section 22-22-23, west of Carlsbad, is spudding at 290 feet in lime.

Chaves County

Warman Oil Trust's No. 1 Weldon & Hoar, NW cor. SE Section 9-14-25, Blackdom district, is rigged and ready to spud as soon as water well is completed. R. D. Compton's No. 1 Emerson, SW cor. SE Section 20-10s-24, Roswell district, is bottomed in sand at 899 feet and underreaming the 8¼-inch to that depth. Matador Oil Co.'s No. 1 Wood, NE SW SW Section 6-4n-20, Salada Creek, is inactive at a total depth of 4,666 feet. It may be drilled to 5,500 feet.

De Baca County

Landowners Oil Co.'s No. 1 McAdoo (State), SW cor. NE Section 16-1s-27, Buffalo Creek, is drilling at 5,114 feet. A break in the lime, the first below the top at 5,005 feet, is reported to be showing some gas at this depth.

San Miguel County

Cabra Springs Oil & Gas Co.'s No. 1, C NE NE Section 22-12n-22, Pino Mesa, is building rig.

Bernalillo County

Norins Realty Co.'s No. 1 Pajarito grant, NW cor. NE Section 22-9n-1e, ran the 10-inch at 3,559 feet and is standardizing.

San Juan County

R. C. Oswell's No. 3, NE NE Section 33-30-11w, south of Aztec, is underreaming pipe to bottom at 900 feet. It is a west offset to No. 2, which came in for 25 bbls. per day. Southern Union Gas Co.'s No. 6 Angel Peak, NW cor. NE Section 11-28-11, Kutz Canon district, is drilling at 2,300 feet. The Point Lookout sand at 3,500 feet is the objective. Kutz Canon Oil & Gas Co.'s No. 1 Day, SW cor. Section 20-28-10, is shut down for new drilling line below 3,800 feet. Gobernador Oil Co.'s No. 1 Liken's SW NE SW Section 12-29-9w, Blanco district, is rigged and ready to spud.

COLORADO

Rio Blanco County

The California Co.'s No. 1 California-Raven, C NW SE Section 30-2n-102, on the Rangely Dome near the Utah line, continues to be the outstanding test in progress in this region. The company is giving out only the depth of the well and according to its statement it was coring at 6,049 feet on September 27. However, since then it is reported to have reached a depth around 6,100 feet. The first saturation was reported at 5,781 feet. Below that depth it is said to have cut layers of sand of varying thickness between strata of shells. Some of the sand strata showed considerable saturation and others were reported dry. Altogether more than 200 feet of saturation has been cored. The well has not been unloaded for a test, but it is reported that it will continue to 6,200 feet and at that point tubing will be run and a test made. If this deep test into the Park City formation (Pennsylvanian and Permian) opens up a producer, it will attract attention to possibilities in that horizon on the Iles, Moffat and Thornburg and other domes in Moffat County, the Meeker and other structures in Rio Blanco County and several domes in Garfield and Mesa Counties which encountered gas in tests to higher formations. Especially will structures in eastern Utah come in for attention. Rangely is not only a very large structure but it has an immense gathering area.

Magnolia Petroleum Co.'s No. 1 Titley, NW cor. SW Section 15-2s-96, Piceance Creek, which is drilling Tertiary beds, is drilling at 1,873 feet in a water sand.

Jackson County

Three locations are reported to have been made on the North and South McCallum Domes near Walden, by Oklahoma and Nebraska parties, but no notice of intentions to drill have yet been filed and no rigs are up. The reported locations are in Sections 14-9n-79, 18-9n-78 and 33-9n-78. These are about 1 mile out from wells drilled by the Continental Oil Co. and are down on the flanks as shown by the best maps available.

Morgan County

Ohio Oil Co.'s No. 1 Butters, C SW SW Section 7-6n-60, northeast of the Greasewood producers, did not look encouraging when bailed down to bottom at 6,718 feet and is drilling deeper. At the above depth, which is 3 feet below old bottom, the oil rose 350 to 400 feet in the hole over night. It is drilling ahead at 6,725 with no increase in oil or gas.

Weld County

W. R. Ramsey's No. 1 St. Anthony (Tighe), SW NE SE Section 15-7n-59, in the New Raymer district, is expected to begin coring for the Timpas lime today and most of the scouts are at the well. This is the first definite marker to be encountered and it is expected at around 5,925 feet. If it is reached at this depth it will indicate that the well is running at least 300 feet higher than Greasewood. The Hygiene was not cored, but the cuttings indicated that the series of sands was reached at 3,100 feet and the true Hygiene sand at 3,280 feet.

Adams County

Hills Dome Lease Development's No. 1 Hills, SE cor. Section 27-3s-64, near Watkins, has not yet started up following the making of a contract with the Pulse Drilling Co., but is repairing rig and getting ready to resume after cementing the 8¼-inch inch at 3,978 feet.

Elbert County

J. M. Botts and others' No. 1 Union Pacific-Richardson, C NW SE Section 7-8s-58, is drilling again after being shut down for a few days. Whether this means that the contract depth of 4,000 feet had been reached and a new contract made, is not known. No information is given out concerning the well.

Lincoln County

Eastern Colorado Oil Co.'s No. 1 State, SE cor. NW Section 36-14s-57, Hugo district, is shut down at 3,465 feet with salt water from the Dakota in the hole, awaiting decision as to whether it will be carried down to the Lakota.

Cheyenne County

Mount Pearl Oil Co., a co-partnership, expects to move in rig in about two weeks for a test 17 miles northeast of the town of Kit Carson. Location is being made by Charles R. Simmons, who with C. W. Melton and Harry Lucile Simmons, comprise the co-partnership. The firm has 18,000 acres under lease and expect to have another block of 14,000 acres turned over to them as soon as rig is on location.

Las Animas County

Paul W. Harr's No. 1 Barela, NE NW NE Section 33-33s-62, Garcia Dome, is drilling at 1,350 feet. The Timpas was topped at 1,252 feet and showed some colors under an ether test. His No. 1 Schneider, SE SW SE Section 10-33-63, Gray Creek, is drilling at 570 feet after being shut down for boiler repairs.

Routt County

The Texas Company's No. 1 Irwin-Carstarphen, NE SE NW Section 5-6n-86, Tow Creek, has cleaned out to bottom at 3,301 feet and has underreamed and lowered the 6¼-inch to 3,238 feet. Mid-Colorado Petroleum Co.'s No. 1 Omholt, NE cor. SE Section 29-4n-87, Fish Creek district, has resumed at 1,700 feet after being down since last January.

WYOMING

Natrona County

President Hoover has issued a proclamation withdrawing, subject to valid existing rights, 160 acres adjoining the Teapot Dome naval reserve which will be added to the reserve for the purpose of protecting the watershed of Reservoir No. 19 which is used for camp purposes. The area withdrawn consists of the SW NE, NW SE and S half SE Section 9-38-78.

Mutual Oil Syndicate's No. 2, C SW SE Section 14-35-79, Midway Dome, is standardizing at a total depth of 6,063 feet to clean out and test the oil showing in the Muddy. The fluid stands about 500 feet from the top, of which a considerable part is oil.

Summitt Oil Co.'s No. 1 Trewitt ranch, NW cor. Section 21-33-80, North Platte, has resumed at 1,530 feet and is estimated to be about 50 feet off the Muddy sand.

Converse County

Continental Oil Co.'s No. 30 Glenrock Sheep, SW SE SE Section 4-33-76, Big Muddy, is shut down at 4,506 feet after recementing to stop caving. Ohio Oil Co.'s No. 25 Kinney, SE SW SE Section 4-33-76, is drilling at 3,777 feet.

Niobrara County

Ohio Oil Co.'s No. 2 Richards & Comstock, C NE SW Section 32-36-65, Lance Creek, is drilling below 3,115 feet, with the Sundance as the objective.

Weston County

The Osage Field, which is the most active district in Wyoming, had one completion in Wyoming-Dakota Oil Co.'s No. 1, SE SW NE Section 15-46-64, in the west extension. It will pump 50 bbls. initial from sand at 2,185-93 feet.

Routine operations in Osage include the following:

Federal Oil Co.'s No. 4, NE SE SE Section 15-46-64, cemented the 8¼-inch at 1,200 feet, and Central Oil Co.'s No.

1, NE cor. SW Section 15-46-64, is bottomed at 2,575 feet. The last named had a small show of oil at 2,512 feet and 1,700 feet of water. The water probably is coming from behind the casing. Tug Oil Co.'s No. 2, NE NW SW Section 15-46-64, is drilling at 2,700 feet, and General Oil Co.'s No. 1, SW cor. NW Section 15-46-64, is fishing at 2,000 feet. Riggs Oil Co.'s No. 2, SE NE Section 16-46-64, is drilling at 2,700 feet, and Paymac Oil Corp.'s No. 1 Toyne, SE NW NE Section 3-46-64, is drilling at 1,000 feet. Sandell and others' No. 2, SE SW Section 12-46-64, is drilling at 900 feet. One new operation was reported in Albert Jones' No. 3, NW cor. SE Section 21-46-63.

Julius Peters and others' No. 1 Witzell, SE cor. NW Section 30-46-64, Fiddler Creek, is bottomed at 4,590 feet and cleaning out to the top of unexploded shot. One hundred quarts was run into the hole last week to shoot the Muddy sand in an effort to make it a producer.

Park County

The Secretary of the Interior has placed Oregon Basin crude oil on a parity with other black oil fields in the Big Horn Basin by removing restriction on the price of crude as established by the department on July 12, 1928. The difficulty over Oregon Basin crude prices arose when a contract between The Texas Company and Cody Petroleum Co. was submitted for approval. The contract called for a price of 55 cents per barrel. The department held that 85 cents was a minimum reasonable price and declined to approve the contract on any other basis. The issue was litigated and the Government won. This automatically fixed the crude price for the field at whatever figure the Government set for its royalty oil. Several changes were made subsequently and the price at present is 60 cents. This, plus pipe line charges, raised Oregon Basin crude above the price for crude from competitive fields and the pool has been practically shut in for some time.

Carbon County

The Mutual Oil Syndicate (Sidney H. Keoughan and others) has moved in a rig for its No. 27, NW SE NE Section 12-18n-78, on the Dutton Creek Dome. It will be drilled with rotary to the Shannon sand at around 1,700 feet for gas. This is the first of two wells to be drilled to determine whether ample gas supplies are available for supplying the town of Laramie. The Keoughan interests recently took over the operation of the Midwest Refining properties on Dutton Creek, which include two oil wells in the Muddy sand. The new location is a half mile south and east of Midwest's No. 31 Eades. The town council of Laramie has granted the Laramie Gas Co. a 25-year natural gas franchise. That company at present serves the town with manufactured gas. Seven months are given to provide natural gas. The town will accept 1,800,000 of gas per year for heating municipal buildings in lieu of a franchise tax. Ohio Oil Co. has a pipe line from the field to Laramie formerly used for oil which fits into the picture and may be used for transporting the gas.

Fremont County

The Texas Company's No. 2 State-Ridgway, SE SW SW Section 36-34n-95, Alkali Butte, is through the Frontier series and is drilling at 3,575 feet in the Mowry shale.

Big Four Oil Co., of Minneapolis, has acquired an 81-acre tract in Section 27-3n-1w, known as the Enos tract, from Delta Oil Co. and is preparing to drill four shallow wells. There are three or four shallow wells on the tract at present making around 6 bbls. each per day. Litigation involving the tract was settled recently. The Delta company was a reorganization of the Pilot Butte Oil & Gas Co. The tract is about half a mile south of the Kinney-Coastal Oil Co.'s gasser.

Yellowstone Oil Co.'s No. 1 Gabus, SW cor. Section 14-38-94, Shoshini district, which shut down two weeks ago at 2,210 feet when a string of tools was lost, is resuming after replacing the combination coredrilling rig with standard equipment. The tools will be sidetracked.

Ward Oil & Gas Co.'s No. 2, NE cor. Section 28-34-90, Dutton Basin, is shut down at 4,200 feet waiting for two carloads of oil to be used in an effort to release the tools. A cavey formation caught the string.

Sublet County

California Petroleum Corp.'s No. 3-I, SE cor. Lot 12, Section 3-26-113, is rigging up to determine the source of water showing in the hole. It is an old well completed at 1,105 feet.

MONTANA

Carbon County

Ohio Oil Co.'s No. 8 Caldwell, SE SW NE Section 12-7s-21, Dry Creek Field, which came in unexpectedly in the Dakota sand when preparations were under way to plug back to the Frontier, flowed between 350 and 400 bbls. into the sump one day the past week after which it was shut in for tankage. All the tanks in the field are full and some of these must be emptied before a 24-hour test is made. The hole was plugged back from 6,887 feet to 4,595 feet. Ohio's No. 11 Bowman, C SE NE Section 4-7s-21, to the northwest of the producers, topped the Dakota at 5,665 feet and cut 14 feet of sand with only a show of oil and gas. It is on its way to the Lakota and is coring at 5,779 feet. Its No. 7 William Robinson, C SE SE Section 3-7s-21, is shut down at 5,753 feet after testing the Lakota.

Glacier County

The number of operations in the Cut Bank area in Glacier County, the most active district in Montana, was increased to 12 this week with the making of two more locations. One of these is The Texas Company's No. 1 Fisher, C S half, SW Section 10-35-5w, a half mile south of the Montana Power Co.'s No. 1 Whetstone, a gasser. It is practically a sure shot for gas. The other location is B. E. Adams' No. 1 Britton, SE cor. NE Section 14-34-6w, a diagonal offset on the northwest to R. C. Tarrant's No. 1 Haglund, a producer.

The next completion in this district probably will be R. C. Tarrant's No. 1 Reickhoff, SE SW NE Section 3-34-6w, a mile to the northwest of the B.&H. Oil Co.'s No. 1 Haines. It is drilling at 2,775 feet and preparing to run pipe on top of the sand. Tarrant's No. 1 Haglund, Sr., NW SW NW Section 13-34-6w, is drilling at 1,100 feet, and his No. 1 Yunk, NW cor. Section 12-34-6w, is drilling at 2,100 feet. Tarrant's No. 1 Britton, NE cor. SE Section 14-34-6w, is ready to spud, and his No. 1 Longmiller, C NE NE Section 24-34-6w, remains a location. His No. 1 McLellan, C SE SW Section 7-34-5w, which will be drilled with a rotary, is rigged up, and his No. 1 Hope, C SW SW Section 18-34-5w, is moving in.

Montana Power Co.'s No. 1 Simereo, C N half Section 5-33-5w, is drilling at 400 feet, and its No. 1 People's, C SW NW Section 20-34-5w, is drilling at 2,160 feet.

Santa Rita Oil & Gas Co.'s No. 1 Yunck, NE NW NE Section 23-34-6w, cemented pipe at 500 feet.

Toole County

One completion was reported in the Kevin-Sunburst Field in the Nepstad-Vander Pas No. 4 Levnick, Section 28-35-1w, which was dry and abandoned after a shot at a total depth of 1,523 feet.

West Side Oil Syndicate's No. 1 Haugen, NW cor. SE Section 11-35-3w, which is testing the Rocky Ridge local high, is drilling at 1,400 feet. It topped the Kootenai at 1,140 feet and is running about 25 feet higher than the nearest well half a mile to the southwest. Eagle Oil Syndicate's No. 1 Haugen, NW cor. Section 12-35-3w (Rice, Buscher and others), is drilling at 1,000 feet. A. E. Crumley and others' No. 6 Jarret, NW SE NE Section 29-35-2w, which is being deepened from 800 feet, is on top of the sand, and William Hewson and others' No. 1 Van Note, NW cor. Section 30-35-2w, is drilling below 200 feet. Missoula-Kevin Oil Co.'s No. 1 Davidson, SE cor. NE Section 28-35-3w, is drilling below 1,000 feet.

In the Border Pool, Askalta Oil Co.'s No. 7 Farbo, SE NW NE Section 2-37-4w, drilled into the pay at 2,470 feet and is running rods and tubing. It probably will make around 100 bbls. initial and is not near so good a well as No. 6 Farbo.

Sweetgrass County

Shoshone Consolidated Oil Co.'s No. 1 Northern Pacific, NW NW Section 23-2n-15e, Hamilton Coulee, is reported drilling below 6,000 feet after setting the 4¾-inch at 5,793 feet.

Pondera County

Adams-Bell Syndicate's No. 1 Venetz, NE SE NE Section 31-27-3w, South Pondera, is fishing for tools at 1,700 feet after going through 15 feet of Sunburst sand which showed considerable gas. The hole caved and caught the tools and cleaning out is in progress.

Yellowstone County

Spokane-Laurel Oil Co.'s No. 1 Nutting, SW SE Lot 5, Section 30-2s-24, Laurel district, is underreaming the 6¼-inch to set at 1,600 feet for a water shutoff before continuing to the Lakota.

UTAH

Utah Southern Oil Co.'s No. 1 Balsey, C NE NE Section 31-23-21, Salt Valley, Grand County, is fishing for tools at 6,065 feet, at which depth there appears to be a marked change of formation which may be the bottom of the salt beds of the Pennsylvanian salt basin of eastern Utah. These salt beds have been very thick and this test has been in salt almost continually from 900 feet. The pre-Pennsylvanian, or Ordovician, is expected shortly after the bottom of the salt is reached.

Diamond Oil Co.'s No. 1, SE NW Section 16-8s-5e, Utah County, is bottomed at 3,545 feet and waiting for special wall packer for water shutoff.

WASHINGTON

Ohio Oil Co.'s No. 1-A Robinson, Section 5-17n-9w, near Aberdeen, is coring at 4,398 feet.

OREGON

Bell View Oil Syndicate and Twin Belle Oil Syndicate, both of Los Angeles, have taken over approximately 4,000 acres 1 to 2 miles southwest of Coquille, in Coos County, from Fat Elk Oil Co., including a well drilled to 1,500 feet. The trade was engineered by W. E. Marrion, president of the Coast Oil Co., who is well known in Wyoming and Montana, and was made after the well had been deepened 100 feet to determine certain geological facts. The deal provides for the completion of this well and the drilling of two more tests.

Good Production of Light Crude Discovered in McDougall-Segur Sand, Turner Valley

By VICTOR LAURISTON

Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Oct. 1.—In the Central Turner Valley, New McDougall-Segur Oil Co.'s No. 5, LSD 14, Section 12-20-3w5, has developed a good production of light crude in the McDougall-Segur sand at 2,880 feet. On a 22-hour test the well produced 100 bbls. of 55 gravity crude, and a settled production around 60 bbls. a day is anticipated. The well is being given a shot, the first shot ever tried in the McDougall-Segur sand. The test was started late in June and required about 10 weeks' actual drilling to reach the producing horizon, at a cost of $11,000 including $3,000 for 13½-inch casing. The test was drilled open hole to 2,100 feet when 13½-inch was run to 2,000 feet and the well finished with 10-inch. The total cost was somewhat less than the company's estimate of between $14,000 and $15,000.

The well was drilled for a definite test of the McDougall-Segur sand, following the action of the government last December in prohibiting any new drilling to the lime. Previous deep lime tests on the McDougall-Segur acreage in this section had indicated fair commercial possibilities in the shallower horizon, and in several wells a considerable production of light crude had been taken from the shallow sand before going deeper. The results secured in the present test may encourage further drilling of this sand by other companies. There are in various parts of the field a considerable number of tests already drilled part way to this horizon and some of these are likely to be deepened for light crude production. The drilling crew which handled the test was in charge of Roy Widney. Another shallow test by the New McDougall-Segur Oil Co. may be started after the results of the shot have been determined.

Kinsella Gasser

In the Kinsella Field, East Central Alberta, Northwestern Utilities' No. 2 Harvey, SW, Section 25-47-11w4, drilled into the gas sand at 2,167 feet, and was finished at 2,184 feet with an open flow of 19,000,000 feet a day. The tools apparently passed out of the sand at 2,181 feet. No. 2 Harvey is 2 miles north and 4 miles east of No. 1 Harvey, LSD 1, Section 17-47-11w4, completed last July at 2,173 feet with a flow of 7,600,000 feet a day; the gas is from the same horizon and the drilling indicates a dip of only a few feet between the two producers. Drilling in of the well was witnessed by Julian Garrett, manager of Northwestern Utilities, Ltd.; C. H. Spencer, general superintendent; Stanley Slipper, chief geologist; E. Nelson, chief engineer, and Frank M. Harvey of Calgary, representing the English owners; while John Harvie, deputy minister of lands and mines and William Calder, director of the petroleum and natural gas division, represented the Alberta government. The drilling was handled by E. W. Bell and J. C. Jefferson under supervision of G. W. Green, the company's field man.

The two Harvey wells in the Kinsella section will not be connected with the Edmonton transmission line at present, but will be held in reserve, the company for the time being taking its entire requirements from the Viking Field. No. 2 Harvey is the largest producer yet drilled by Northwestern Utilities, Ltd., and is only slightly smaller than Duluth Syndicate's No. 1, now owned by Messaba Oil & Gas Co., which opened the field several years ago. The Duluth Syndicate well in LSD 3, Section 29-48-10w4, has been

shut in since its completion for lack of a market, though efforts have been made to secure a market for the production in Saskatoon and other Saskatchewan cities.

No. 2 Harvey is midway between No. 1 Harvey and Duluth Syndicate's No. 1, the latter being to the east and north of the new producer. No. 1 Harvey got its production from a horizon approximating the producing sand of the Viking Field, north and west of the Kinsella area, and No. 2 Harvey, with a slight dip, apparently got gas in the same sand, indicating that the production in the Harvey wells may represent an important southeasterly extension of the Viking Field rather than a new field. Duluth Syndicate's No. 1, about 6 miles north of No. 2 Harvey, and a little east, got its production, however, at 2,085 feet, apparently from a different sand and possibly a different structure. Further drilling in the area between No. 2 Harvey and Duluth Syndicate's No. 1 will ultimately determine the relation between the two producing areas.

No. 2 Harvey is understood to be the last well of the Northwestern Utilities, Ltd., drilling program for the current year. The program called for two wells in the Viking Field, and two wells in the Kinsella Field. The Kinsella wells were drilled on acreage owned by an English syndicate represented in Canada by Frank M. Harvey of Calgary.

Turner Valley Deep Test

In the Central Turner Valley, McLeod Oil Co.'s No. 4, LSD 16, Section 1-20-3w5, is drilling its deep test below 7,520 feet, being more than 920 feet below the previous record depth for Canada. The drill is working in a difficult formation which cakes and impedes drilling. Samples show some emulsion of oil and gas with apparently a little more gas than previously.

Illinois-Alberta Lease

Assets of New Illinois-Alberta Oils, Ltd., which were purchased from the liquidator by Harry Oliver of Calgary have been turned over to Bows Oil Co., a private syndicate. The new owner is cleaning out Illinois-Alberta's No. 1. This well some years ago had a production of 107 bbls. a day from the Madison lime; it bottoms at 3,890 feet having been deepened a little in a previous effort to restore production. Illinois-Alberta's No. 2, which was started immediately after No. 1 got its production in the lime, is standing around 3,600 feet, a little short of that formation; it ran into drilling difficulties at that depth and is not likely to be completed.

South Turner Valley

In the South Turner Valley, Mar-Jon-Freehold's No. 1, LSD 9, Section 28-18-2w5, is drilling below 5,080 feet after cementing, and is apparently close to the Madison contact.

Canadian Royalties' No. 1, LSD 9, Section 5-19-2w5, is drilling below 2,975 feet after encountering a good show of green crude at 2,865 feet.

North Turner Valley

In the North Turner Valley, Model Oils' No. 2, LSD 16, Section 22-20-3w5, is redrilling and carrying 10-inch casing at 2,850 feet after cementing back from 3,953 feet.

Application has been made to the Turner Valley Gas Conservation Board to have Model Oils' No. 1, LSD 8, Section 22-20-3w5, classified as a crude oil producer and exempted from conservation regulations. The board is making further special tests to determine actual conditions, following which a final ruling will be made. It is claimed Model's No. 1 differs from other deep lime producers in that the light crude is forced from the well by the gas, while in other wells crude naphtha accompanies and has to be separated from the gas. Under recent conservation orders, Model's No. 1 went off production entirely.

Work has been resumed on United Oils' No. 4, LSD 2, Section 24-20-3w5, which some years ago got a fair production of light crude in the Dalhousie sand at 5,390 feet. It was later deepened to the Madison lime in which casing was cemented at 5,910 feet. Drilling continued in the Madison to 6,250 feet when the drill entered a shale formation, believed to be a recurrence of the Benton, drilling continuing to 6,360 feet. No commercial production of either gas or naphtha was met in the lime, and operations were discontinued. Later the test was cemented back and has been sidetracking lost tools, and at last reports was working around 5,250 feet and carrying casing behind the tools. It is planned to drill to the Dalhousie horizon and take production there.

Red Coulee Producer

On the Montana end of the Red Coulee structure, Askalta Oils' No. 7, Section 2-27-4e, has been finished at 2,480 feet and is taking flush production around 75 to 100 bbls., after drilling 2 feet into the sand. It is stated the new producer will bring the Askalta company's production, all from the Montana end of the field, up to 15,000 bbls. a month.

On the Alberta end of the structure, D. A. McDonald Syndicate's No. 1-A Kotop, Section 2-1-17w4, is cementing to sidetrack bailer lost between 2,100 and 2,200 feet.

Twin River Test

The Twin River structure in southern Alberta, southeast of Lethbridge and close to the Montana boundary, which was tested earlier in the year by Parco Oil Co.'s No. 1 Twin River, LSD 16, Section 34-1-20w4, is to get another test on acreage of the Nordon Corp. Nordon Corp. has extensive holdings in the Twin River area, and Parco's No. 1 test was drilled by that company, a Canadian subsidiary of the Consolidated, under arrangement with the Nordon corporation and on Nordon holdings.

Parco's No. 1, last fall, got a show of 31.5 gravity crude just below the Ellis-Madison contact between 3,870-90 feet. The hole was later deepened to 4,072 feet encountering a big water flow at 3,938 feet. It was plugged back to 3,890 feet and tested, early tests indicating 10 bbls. a day pumping production. A couple of shots failed to improve this, and work was ultimately discontinued.

Since then further investigations of the structure have been carried on by the Nordon Corp. as a result of which arrangements have been made for a second test. No announcement has been made as to the exact location, but it is understood drilling will be carried on through the winter. Similar crude oil shows were met in other tests over a wide area, including Texas-Imperial's No. 1, west of Lethbridge, Hudson's Bay Oil & Gas Co.'s No. 1 Keho, still farther north and west, and Alberta Pacific's No. 1 on the Spring Coulee structure. Considerable work has been done south of Spring Coulee, and it is understood the new test will be in that direction. Parco Oil Co. is still retaining considerable of its acreage in the Twin River area but is not planning to do any active work in the near future.

Tests in the Foothills

On the Moose Mountain structure, Elbow Oils' No. 1, LSD 11, Section 35-22-5w5, is below 3,635 feet and working at a caving formation close to the potential oil horizon in the Home sands.

In the old Oil City Field, southern foothills, Oil City Royalties' No. 1, Section 30-1-30w4, is reported rigged up ready to spud in.

Hudson's Bay Drilling

In the Keho Lake area, northwest of Lethbridge, Hudson's Bay Oil & Gas Co.'s No. 1 Keho, LSD 2, Section 17-11-22w4, is reported sidetracking below 4,859 feet, about 60 feet above the potential oil horizon in the top of the Madison lime. Announcement is made that Nordon Corp. is holding 1,000 acres in this area.

Manitoba Test

In the Manitou district, southwestern Manitoba, Commonwealth Petroleums' No. 2 Pembina Valley, LSD 2, Section 26-2-9-wPM, is making new hole below 2,521 feet after cementing casing. The drill is in or near the top of the Winnipeg sand and some oil shows have been reported.

British Columbia Test

In southeastern British Columbia, Crow's Nest-Glacier Oil Co.'s No. 1, in the Sage Creek district, is shut down at 3,260 feet waiting for casing. It is planned to run 4-inch inside the 6-inch pipe, the latter having broken, letting in some water. As soon as this is done, the test will be deepened, good shows of light crude having been already encountered at this depth.

Southeast Alberta Prospect

In Southeast Alberta, George Hatch and associates are reported to have drilling equipment at Walsh, close to the Alberta-Saskatchewan boundary, for a test to be drilled near that town. It is understood the syndicate plans to test a potential structure in the Many Island Lake area.

The Many Island Lake area is supposed to be a northeasterly extension of the Medicine Hat Field. It lies about 35 miles northeast of Medicine Hat and close to the Saskatchewan boundary. Recent drilling northeast of the Medicine Hat municipal gas field has brought in several good gassers, somewhat larger than any in the original field; and an extension of the Medicine Hat structure in that direction is regarded as possible.

Ontario Drilling

In the Dawn Field, Lambton County, Ontario, Union Gas Co.'s No. 64, Lot 24, Concession 2, Dawn Township, is reported drilling below 700 feet. Union's No. 61, NW, Lot 23, Concession 2, is prepar-

Six Completions in the Michigan Field; Best Estimated at 550 Barrels Initial

By GEORGE A. WHITNEY

MOUNT PLEASANT, Mich., Oct. 3.—A half dozen completions were reported in the Central Michigan Field for the week, three being producers with an initial of 1,100 bbls. and three were dry holes. The largest producer was the Wellman Oil Co.'s No. 2 well, 360 feet from the south line and 990 feet from the west line of the John Bolen farm, SE SE NE Section 14, Greendale Township, Midland County, with an initial estimated at 550 bbls. Pure Oil Co.'s No. 5 well, 1,650 feet from the north and west lines of the George Purtell and others farm, in the E half NW Section 15, same township, and on 60 acres, is reported with an initial of 300 bbls.

Columbia Oil & Gas Co.'s No. 2 well, 990 feet from the south and west lines of the M. F. McLaughlin farm, in the NE SW NW Section 15, Greendale Township, produced 250 bbls. initial from the Dundee formation.

Edward Stewart and others' No. 3 well, in the northwest corner of the John Opperman and others farm, NW NW SE Section 12, Greendale Township, is reported a dry hole.

Columbia Oil & Gas and the Gordon Oil Co.'s No. 2 well, 990 feet from the south line and 330 feet from the west line of the F. H. Talker farm, in the NW SW SW Section 7, Lee Township, Midland County, is reported a dry hole. W. Hunter Atha is drilling a test, 958 feet from the south line and 330 feet from the west line of the State of Michigan land, in the NW SW NW Section 18, Lee Township, same county, and the Gordon Oil Co. is drilling No. 2, in the northwest corner of the W. D. Hewitt farm, in the NW NW NW Section 18, same township.

In Isabella County, George C. Hanners' test, in the northeast corner of the Henry A. Welch farm, NE NW NE Section 25, Isabella Township, is reported a dry hole.

Reports come from Missaukee County that two dry holes have been completed by the Pioneer Oil & Gas Co., one on the Porter ranch, Section 12, Pioneer Township, and the other on the G. D. Miller farm, in the NW NE NE Section 24, same township.

The Michigan Oil & Gas Corp.'s second test, 330 feet from the south line and 990 feet from the west line of the Ira Bond farm, in the SE SW NE Section 12, Greendale Township, Midland County, is estimated with an initial of 100 bbls. The initial well, which is less than a quarter of a mile west of No. 2, came in as 325 bbls. initial.

The east border of the East Pool proves a tricky oil area, and operations during the past week had strengthened the saying among operators that tests drilled in the district bordering on the east of the main pool are "all wildcats." Every test drilled has had no particular relation to others in production.

W. L. McClanahan, Inc., secured drilling permits for No. 7 well, in the northeast corner of the A. G. Struble farm, NE NE SW Section 10, Greendale, Midland County, and No. 2 well, in the northeast corner of the W. S. Root farm, in the NE NE SW Section 12, same township. R. D. Malcolm secured a permit for No. 2 well, in the southeast corner of the Hastings farm, NW NW Section 13, Greendale Township, Midland County. Gordon Oil Co. has a permit for a second test in the northwest corner of the William D. Hewitt farm, NW NW NW Section 18, Lee Township, Midland County. The well is spudding in.

Field Pickups

The test of Thompson Brothers, in the the northwest corner of the D. A. and Maud Newland, in the SW SE Section 19, Lee Township, Midland County, proved a dry hole in the Dundee.

No. 2 well, 990 feet from the north line and 330 feet from the west line of the John Opperman and others, in the SE NE SE Section 12, Greendale Township, Midland County, owned by Edward Stewart and others, is reported a dry hole.

The Pure Oil Co. pipe line is carrying 20,000 bbls. a day, the capacity of the 6-inch line, and will curtail new drilling after wells for which rigs are now being provided get under operation. Tank storage facilities have been taxed to the utmost. Tanks in the field and at the Bay City terminal of the line are reported carrying large storage. The navigation season soon will end, suspending further shipments from Bay City.

The Pure Pipe Line Co., which handles oil from the wells of a number of independent produces, besides its own, installed heavier pumps recently to provide additional pressure for its line. Rumor has it that the company contemplates the construction of a supplementary line from the Isabella-Midland Field to Toledo, Ohio, where the Pure Oil Co. has a large refining plant along the water front, on the east side of the Maumee River and bay.

A test for oil is to be drilled by Detroit and Alma interests a mile or so southeast of Alma in Gratiot County. Considerable leasing has been done in the past few weeks along the Pipe River. The test is to be drilled on the H. L. Layden farm.

Although more than 2,000,000 feet of gas from the Marshall formation was found in a well on the Clarence Thayer farm, NW NW SW Section 23, Vernon Township, Isabella County, in the Vernon Field, this gas has been cased off and the drilling continued towards the Dundee formation in search of oil. The gas in the Lynch well in Section 35 has also been cased off and an attempt will be made to locate oil in the Dundee. This action is being taken in the wells in the Vernon Field because there is no pipe line for gas.

ing to clean out; the well has a potential pumping production of around 25 to 28 bbls. a day. When this work is finished, Union's No. 63, Lot 24, Concession 2, which has a potential production of around 100 bbls. a day with considerable gas, will be cleaned out and given a definite production test. No. 64 is 600 feet northeast of No. 63 and will test a possible extension of the oil production in that direction.

Farther west, Black Bear Syndicate's No. 1, N half, Lot 15, Concession 13, Sombra Township, is reported standing at 420 feet. The location is north of Wilkesport and about 8 miles west of the Dawn Field, and southeast of St. Clair, Mich., where gas was encountered some years ago. It is reported that arrangements are being made to resume drilling this fall.

Alberta Oil Production

Official figures issued by the Alberta lands and mines department show that crude oil production for all Alberta pools in August totaled 72,896 bbls. This total included 68,696 bbls. of crude naphtha and 1,013 bbls. of light crude oil from Turner Valley, 2,442 bbls. of light crude from Red Coulee and 745 bbls. of heavy crude from the Wainwright Field.

Turner Valley Conservation

Tests of the Turner Valley Field conducted by the Turner Valley Gas Conservation Board are expected to be finished late in October. The testing of the second major area has been completed, and testing of the third major area, comprising wells in the Central Turner Valley, was commenced on September 28. When this is completed, tests will be made of the North Central and northern sections. This work will be finished the latter part of October.

With the completion of the tests the board will be in a position to consider the formulation of a voluntary pooling agreement among the various Turner Valley operators, under which proceeds of the sale of naphtha can be equitably divided and all the operators have some share in the proceeds of gas sales. When the board was constituted last May, it was expected to work out some scheme of unit operation after careful tests of the field had given definite information as to actual conditions. The preliminaries of the proposed voluntary pooling agreement were discussed at a meeting of the Turner Valley operators convened by the Gas Conservation Board at Calgary on September 30; after which adjournment was made to permit a study of the information already disclosed by the tests and of possible solutions of the pooling problem.

California Fields

(Continued from Page 79)

2 Trust and should be in a position to make a bid for production in the not distant future.

Seal Beach

The Continental Oil Co. is working on two potential producers in the Seal Beach Field of Los Angeles Basin and one of these, No. 34 Bixby, should be listed for early completion as a satisfactory water shutoff was effected at 5,935 feet and the hole drilled ahead to 6,156 feet. It is the present intention to open some additional hole before making a production test. The Union Oil Co. has just spudded in No. 2 Vidor, a new well in the Playa Del Rey Field of Los Angeles Basin. The Standard is running two strings of tools in the West Coyote Field and while No. 52 Emery, another well in this field, is standing rigged up it will not be spudded in until crews are available upon the completion of one of the two wells now under way. In the Potrero Field the Wilshire Oil Co. is considering the advisability of landing a string of 6⅝-inch casing in No. 1 Neace, which has been causing considerable trouble because of a heaving sand at 7,177 feet. On the Potrero Country Club property, the Wilshire has suspended drilling operations on well No. 1 at 5,282 feet and is redrilling well No. 3 at 3,835 feet. Deep zone exploration in the Inglewood Field was rather unsatisfactory during the week as none of the deep tests being drilled around the edge of the structure showed any improvement.

Wildcat Operations in Oklahoma

(Continued from Page 74)

POTTAWATOMIE COUNTY

Brown et al's No. 1 Sauter, NW cor. Sec. 35-11-4 ..... **Digging cellar.**

ROGER MILLS COUNTY

Ute Oil Co.'s No. 1 Williams, C SW Sec. 23-12-24w ..... **S.D. 5,150 ft.**
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-26w ..... **S.D. 3,420 ft.**

SEMINOLE COUNTY

Donnelly et al's No. 1 Shepard, SE NE Sec. 4-8-8 ..... **U.R. 1,120 ft.**

WASHITA COUNTY

Miley Pet. Co.'s No. 1 Montgomery, SW NW SE NW Sec. 23-9-17w ..... **S.D. 1,004 ft.**
Miley Pet. Co.'s No. 1 Wolfe, NE SW Sec. 23-9-17w ..... **Rig.**
Cooper & Terhune's No. 1 Blocker, NW cor. Sec. 29-8-19w ..... **Show oil 2,459-67 ft.; S.D. 2,757 ft**
Burns & Prince's No. 1 Deck, SW cor. Sec. 21-8-18 ..... **S.D. 2,160 ft.**

Oklahoma Panhandle

TEXAS COUNTY

Three Way Oil Co.'s No. 1 Crane, SW NW Sec. 11-1-18 ... **T.D. 4,720 ft.; to cement.**

Southern Oklahoma

ATOKA COUNTY

Malarnee et al's No. 1 D. O. K. Land Co., C E half SE Sec. 35-2s-13 ..... Drlg. 620 ft.
E. B. Croxton's No. 3 Moore, CWL NW NW Sec. 2-1s-14 ..... S.D. 450 ft.
McClure et al's No. 1 Little John, NE NW NE SW, Sec. 9-1s-14 ..... S.D. 200 ft.
Morris et al's No. 1 Ray, NE NW NE, Sec. 8-2s-12 ..... S.D. 610 ft.
Brookshire's No. 1 R. W. Rowland, NW NE SE Sec. 18-3s-10 ..... Drlg. 2,850 ft.

BRYAN COUNTY

A. C. Hahnee et al's No. 1 White, NW NE NW Sec. 28-6s-8 ..... S.D. 1,542 ft.
Hughes' No. 1 Ayres, NE SW, Sec. 30-7s-7 ..... Abd. 906 ft.

JEFFERSON COUNTY

Bridwell's No. 1 Wolghomuth, NW NE SE NW, Sec. 30-6s-5w ..... S.D. 500 ft.
Shasta Oil Co.'s No. 1 Bollinger, SW NE SW, Sec. 26-4s-6w ..... Abd. 2,676 ft.
E. S. Bonner's No. 1 Burgess, NE SE Sec. 12-5s-8w ..... S.D. 750 ft.

MARSHALL COUNTY

Thomas' No. 1 Setliff, SW SE SE SW Sec. 36-5s-6 ..... S.D. 20 ft.

McCURTAIN COUNTY

Stampfs' No. 1 Robert Harris, SW NW SW Sec. 14-3s-25 .. S.D. 2,778 ft.

PUSHMATAHA COUNTY

Whitehead et al's No. 1 Messer, SE SW SW Sec. 35-3s-18 ..... S.D. 1,950 ft.

STEPHENS COUNTY

Gillette Bros.' No. 1 Cooley, NW SE NW Sec. 17-2s-8w .. **Rig.**
George's No. 1 Ryan, NW SW NE, Sec. 31-3s-15 ..... S.D. 510 ft.

Gulf Coast Fields and Wildcats

(Continued from Page 77)

Gulf Prod. and Humble O. & R. Co.'s No. 4-A F. I. Booth, 300 ft. S and W, SW cor. of Gubbels 100-ac. tr., Blk. 4, Samuel Kennedy Sur. ..... Sandy shale 5,207 ft.; cmtd. 7-in. csg.

Gulf Prod. Co. and Humble O. & R. Co.'s No. 5-A F. I. Booth, 400 ft. E and 300 ft. S of SW cor. of Gubbels 100-ac. tr., Blk. 4, Samuel Kennedy Sur. ..... Drlg. shale and lime 3,285 ft.

Gulf Prod. Co. and Humble Oil & Ref. Co.'s No. 3 T. R. Booth, Samuel Kennedy Sur., 2,991 ft. from W line and 487 ft. from E line of E half of tract (452 ac.) ... Sandy shale 4,988 ft.; cmtd. 7-in. csg. 4,975 ft.

Gulf Prod. Co. and Humble O. & R. Co.'s No. 4 Meyers, John Rabb Sur., 250 ft. E of No. 3 ..... Drlg. sandy shale 5,004 ft.

Gulf Prod. Co. and Humble Oil & Ref. Co.'s No. 5 Meyers, J. Rabb Sur., 1,000 ft. W and 250 ft. N of SE cor. of Meyers 188-acre tract ..... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 4 T. R. Booth, Samuel Kennedy Sur. (location to come) .... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 6-A F. I. Booth, Samuel Kennedy Sur. ..... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 3 Davis, Robt. Peebles Sur., 2,985 ft. from W line and 350 ft. from N line ..... Cored shale and sand showing oil 5,419 ft.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 5 George, John Rabb Sur., 1,000 ft. E of No. 4 ..... Drlg. sandy shale and lime 2,960 ft.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 2-B George, John Rabb Sur., 1,000 ft. from W line and 330 ft. from N line of "B" lease ..... Setting 7-in. (O.D.) screen 5,275 ft.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 3-A George, J. Rabb Sur., 1,000 ft. from W line and 350 ft. from S line of tract ..... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 4 Lockwood-Second hole, John Rabb Sur., 250 ft. E of No. 4 Lockwood-First hole ..... Comp. flowing 1,500 bbls. daily 5,205 ft.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 5 Lockwood, John Rabb Sur., 300 ft. from N line and 1,000 ft. from W line of 380-ac. tract ..... Derrick.

Humble O. & R. Co. and Gulf Prod. Co.'s No. 8-A Lockwood & Sharp, J. Rabb Sur., 1,000 ft. W, 300 ft. S NE cor. of 369.3-ac. tract ..... Drlg. sticky shale 5,513 ft.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 9-A Lockwood & Sharp, J. Rabb Sur., due S offset Gulf and Humble's No. 4 Meyers ..... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 10-A Lockwood & Sharp, J. Rabb Sur. ..... Derrick.

Humble O. & R. Co. and Gulf Prod. Co.'s No. 4-B Lockwood & Sharp, J. Rabb Sur., 1,242 ft. from W line and 526 ft. from S line of tr. ..... Drlg. sand and shale 5,026 ft.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 5-B Lockwood & Sharp, John Rabb Sur., 800 ft. W of No. 4 ..... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 6-B Lockwood & Sharp, John Rabb Sur., 800 ft. E of No. 4 ..... Derrick.

Humble Oil & Ref. Co. and Gulf Prod. Co.'s No. 1 R. A. and O. H. Wolters, Robt. Peebles Sur., 325 ft. S and 500 ft. W of NE cor. of 1,000-ac. tract ..... Derrick.

Humble Oil & Ref. Co.'s No. 1 Gubbels, Samuel Kennedy Sur., 750 ft. N and 775 ft. W of SE cor. of Mrs. Mary Gubbels 90.6 acres ..... Derrick.

The Texas Company's No. 2 Wolters, Samuel Kennedy Sur., 350 ft. out of SE cor. of 100-ac. lease ..... Sand showing oil 5,170-84 ft.; cmtd. 7-in. csg. 5,160 ft.

HIGH ISLAND—GALVESTON COUNTY

Yount Lee Oil Co.'s No. 30 Cade, N. Fitzsimmons Sur., 300 ft. NE of No. 28 in line parallel with NW line Blk. 15 ..... Set 24 ft. of 5½-in. screen 5,149 ft.; comp. flowing 510 bbls. P.L. oil, ½-in. choke.

Yount Lee Oil Co.'s No. 31 Cade, N. Fitzsimmons Sur., midway between and in line with Nos. 21 and 29 Cade ..... Drlg. sand and lime 5,420 ft.

Yount Lee Oil Co.'s No. 2 Broussard & Orme, Martin Duman Sur., 300 ft. SE of No. 1 ..... Drlg. shale 5,900 ft.

Yount Lee Oil Co.'s No. 12 Smith, Martin Dunman Sur., 330 ft. W of No. 11 and 100 ft. N of No. 2 ..... Drlg. sand and shale 5,375 ft.

Yount Lee Oil Co.'s No. 32 Cade, N. Fitzsimmons Sur., 600 ft. due S of No. 30 ..... Drlg. 300 ft.

Yount Lee Oil Co.'s No. 2 M. M. Spencer, Martin Dunman Sur., center of tract in line with No. 11 Smith and No. 2 Nellie League ..... Drill stem stuck 5,723 ft.; milled out 4,633 ft.; drlg. sidetracked hole 5,220 ft.

MANVEL—BRAZORIA COUNTY

The Texas Company's No. 2 Ewing, 1,220 ft. southwesterly and 200 ft. northwesterly at right angles out of E cor. of Blk. E of Suburban Gardens Subd., Harvey N. Little Sur. ..... Drlg. sand and boulders 1,272 ft.

BATSON—HARDIN COUNTY

Gulf Prod. Co.'s No. 173 Wing, J. Knight Sur. ..... Completed.

SARATOGA—HARDIN COUNTY

Rio Bravo Oil Co.'s No. 88-A Jordit ..... Set 15 ft. of 8¼-in. screen 1,204 ft.; comp. pumping 15 bbls. net oil.

SOUR LAKE—HARDIN COUNTY

Houston Prod. Co.'s No. 1 Merchant, Stephen Jackson Sur., 90 ft. from E line and 1,226 ft. from S line of lease ..... Rig.

Jackson Mineral Oil Co.'s No. 1 Lula Hebert, 50 ft. from N line and 72 ft. from E line of 2-acre tract, Lot 3, Stephen Jackson Sur. ..... Cap rock 2,885-92 ft.

HUMBLE—HARRIS COUNTY

J. D. Clay's No. 3 Bender, Robert Dunman Sur., 260 ft. N and 50 ft. W of SE cor. of Bender 100-acre tract.. Set 53 ft. of 4½-in. screen 1,200 ft.; comp. flowing 75 bbls. net oil.

Sun Oil Co.'s No. 28 Bender, W. B. Adams Sur., 350 ft. W of No. 27 ..... No report.

Sun Oil Co.'s No. 59 River, R. Dunman Sur., 74 ft. from E line and 1,441 ft. from S line of block ..... No report.

Sun Oil Co.'s No. 61 River, Robert Dunman Sur., 234 ft. from W line and 2,272 ft. from S line ..... Set 58½ ft. of 5¾-in. screen 1,280 ft.; comp. flowing 80 bbls. net oil.

Sun OilSun Oil Co.'s No. 62 River, Robert Dunman Sur., 100 ft. due E of J. D. Clay's No. 3 Bender ..... Drlg. gumbo 820 ft.

J. O. Williams' No. 1 Stockdick, James Strong Sur., 100 ft. out of SE cor. of 22-acre lease ..... Drlg. 225 ft.

MYKAWA—HARRIS COUNTY

Crown-Framer Oil Co.'s No. 3 Minnetex, 100 ft. from N line and 100 ft. from E line of W half of Block 251, Wm. Lovett Sur. ..... Drlg. sand and lime 3,071 ft.

Hamill & Smith's No. 1 Ward, 50 ft. out of SE cor. of Ward 10-ac. tract, Blk. 186, Wm. Lovett Sur. ..... Drlg. hard sand and lime 3,726 ft.

PIERCE JUNCTION—HARRIS COUNTY

Gulf Production Co.'s No. 35 Taylor, Hamilton Sur. No. 52, 50 ft. S of No. 1 ..... T.D. 4,650 ft.; sidetracked 3,720-3,858 ft.; set 1 jt. screen; rig up to pump.

Rio Bravo Oil Co.'s No. 12 fee, J. Kopman Sur., 350 ft. from N line and 150 ft. from W line of tract ..... Set 25 ft. of 4¾-in. screen 3,528 ft.; swabbed salt water; drlg. deeper in hard, broken rock 3,781 ft.

Rio Bravo Oil Co.'s No. 25-A Settegast, 625 ft. W and 525 ft. N of SE cor. "A" lease, Jas. Kopman Sur. No. 44 ..... Drlg. hard sand and lime 3,521 ft.

Rio Bravo Oil Co.'s No. 26-A Settegast, J. Kopman Sur., 1,210 ft. from N line and 750 ft. from E line of "A" lease ..... Location.
Rock Drlg. Co.'s No. 1 Hooks, Jas. Hamilton Sur. No. 52, 160 ft. S and 60 ft. E of Humble's No. 1 Hooks ... Drlg. shale and lime 3,512 ft.

FANNETT—JEFFERSON COUNTY

Gulf Prod. Co.'s No. 6 Burrell, Wm. Smith Sur., 1,610 ft. N and 300 ft. E of SW cor. of 232-acre tract .... Drlg. hard sand 3,353 ft.

CLAY CREEK—WASHINGTON COUNTY

Clay Creek Oil Co.'s No. 1 Bimage, C of E half J. P. Perry Sur., 200 ft. from W line and 1,300 ft. from S line of 242-acre tract ..... Coring sand showing oil 1,705 ft.; top of sand 1,700 ft.

ESPERSON—LIBERTY COUNTY

Cranfill-Reynolds Co.'s No. 7 Davis (D.D.), David L. Kokernut Sur. ..... Rig up to deepen 6,302 ft.
Cranfill & Reynolds' No. 5 Esperson (W.O.), M. Duncan Sur., 100 ft. N line and 300 ft. E line ..... Drlg. sand and shale 6,710 ft.
Cranfill-Reynolds Co.'s No. 9 Moore's Bluff, M. Duncan Sur., 500 ft. S of N line of Moore's Bluff tract in line with No. 6 Davis and No. 6 Moore's Bluff ..... Location.
Cranfill-Reynolds Co.'s No. 10 Moore's Bluff, M. Duncan Sur., 1,500 ft. from E line and 2,100 ft. from N line of 632-ac. tract ..... Drlg. sandy shale 3,236 ft.

HULL—LIBERTY COUNTY

Aberoil Co., Inc.'s No. 1 fee, Jesse DeVore Sur., 700 ft. from E line and 64 ft. from N line ..... No report.
Carpenter & Parr's No. 1 Antilley, Jesse DeVore Sur., 100 ft. out of NE cor. of Antilley 20-acre tract ..... Drlg. 350 ft.
Eclipse Oil Co.'s No. 1 Knox-Nelson-Layton, Jesse DeVore Sur., 30 ft. from N line and midway E and W of ½-acre tract ..... Derrick
Empire G. & F. Co.'s No. 34 Barngrover, Jesse DeVore Sur., 75 ft. out of SW cor. of lease ..... Drlg. shale 4,201 ft.
Fendren & Snowden's No. 1 Humble fee, Jesse DeVore Sur., 250 ft. from E line and 50 ft. from S line of Humble Oil & Ref. Co.'s Hooks-Carr fee 6 acres ... Drlg. gumbo 1,310 ft.
Gulf Prod. Co.'s No. 51 Dolbear (W.O.), 1,560 ft. from N line and 2,440 ft. from W line ..... Cmtd. csg. 3,040 ft.; drlg. plug.
Hannah Oil Co.'s No. 1 Hannah, Jesse DeVore Sur., 100 ft. W of The Texas Co.'s No. 1 Hannah ..... Drlg. shale 2,675 ft.
Houston Prod. Co.'s No. 1 Baldwin, Jesse DeVore Sur., 222 ft. from S line and 50 ft. from E line of 5-acre tract ..... T.D. 4,711 ft.; sidetracking 4,585 ft.
Republic Prod. Co.'s No. 19 Dolbear (W.O.), Jesse DeVore Sur. ..... Set 43 ft. of 4½-in. screen 1,865 ft.
Republic Prod. Co.'s No. 141 Dolbear (W.O.), Jesse DeVore Sur. ..... Sand and shale 2,653 ft.; cmtd. 4½-in. csg. 2,620 ft.
The Texas Company's No. 7 Hannah (W.O.), 200 ft. out of SW cor. tract in Jesse DeVore Sur. ..... Set 112 ft. of 3-in. screen 5,096 ft.; comp. flowing 600 bbls. daily, ⅝-in. choke.

NORTH DAYTON—LIBERTY COUNTY

V. H. Borsodi's No. 2 Gulf fee (W.O.), H.&T.C. Sur., 600 ft. from N line and 82 ft. from E line of tract.. Sand 5,073 ft.

MARKHAM—MATAGORDA COUNTY

Ryeade Oil Corp.'s No. 4 Meyers, 250 ft. from S line and 125 ft. from E line of SW, Blk. 1, William Hadden Sur. ..... Drlg. shale 3,622 ft.

CONROE—MONTGOMERY COUNTY

Gulf Coast Drlg. & Prod. Co.'s No. 1 Keystone Mills, 300 ft. out of NE cor. of A. S. James (T.&N.O. No. 4) Sur. ..... Drlg. sticky shale 4,405 ft.
Gulf Coast Drlg. & Prod. Co.'s No. 2-B South Texas Dev. Co., Theo. Slade Sur., 466 ft. out of SW cor. of 40-acre lease ..... Drlg. shale and lime 3,576 ft.
W. B. Hamilton et al's No. 1 Moorehead, J. McHorse Sur., 466 ft. from S line and 466 ft. from W line of Hill & Hill Moorehead 40-acre tract ..... Rig.
Hooper Oil Co.'s No. 1 W. M. Hooper, 466 ft. from N line in center east and west of L.&G.N. Sur. A-649.. Set screen 5,037 ft.; comp. est. 2,000 bbls. daily.
Houston Oil Co. and Heep Oil Co.'s No. 1 Dobbins, Ransom House Sur., 466 ft. east of W line in center north and south of 100-ac. tract ..... Drlg. hard sandy shale and lime 4,767 ft.
Houston Oil Co. and Heep Oil Co.'s No. 1 W. N. Hooper, Jr., 450 ft. from N line in center of east and west of L.&G.N. Sur. A-650 ..... Set screen 5,115 ft.; comp. est. 2,000 bbls. daily.
Humble Oil & Ref. Co.'s No. 2 Dobbins, Ransom House Sur., 1,400 ft. northeasterly along SE line of lease from SW cor. and 466 ft. northwesterly at right angles ..... Spudded.
Humble Oil & Ref. Co.'s No. 1 Madeley, Ransom House Sur., 466 ft. northwesterly at right angles from S line of tract and 518 ft. easterly from NW cor. of Dobbins 329.6 acres ..... Cmtd. surface csg. 1,140 ft.
Humble Oil & Ref. Co.'s No. 2 Madeley, Ransom House Sur., 466 ft. southwesterly along southernmost SE line from SE cor. of tract and 466 ft. northwesterly at right angles ..... Bldg. derrick.
Humble Oil & Ref. Co.'s No. 2 South Texas Dev. Co. (W.O.), Theo Slade Sur. ..... Coring sand 5,100 ft.
Humble Oil & Ref. Co.'s No. 7 South Texas Dev. Co., Theo. Slade Sur., 331 ft. S of S line of Martin & Dewey 30-ac. tract and 330 ft. W of SE cor. ..... Comp. flowing 2,000 bbls. daily 5,166 ft.
Humble Oil & Ref. Co.'s No. 9 South Texas Dev. Co., Theo. Slade Sur., 330 ft. E and 328 ft. N of SE cor. Gulf Coast Drlg. & Prod. Co.'s 60 ac. ..... Sand showing oil 5,136 ft.; cmtd. 7-in. csg.
Humble O. & R. Co.'s No. 10 South Texas Dev. Co., 1,-125 ft. from S line and 660 ft. from E line of Sur... Sand and shale showing oil 5,164 ft.; setting screen.
Humble Oil & Ref. Co.'s No. 11 South Texas Dev. Co., Theo. Slade Sur., 466 ft. S and 466 ft. E of SW cor. of 40-acre "F" lease ..... Drlg. shale 2,118 ft.
Humble Oil & Ref. Co.'s No. 12 South Texas Dev. Co., 466 ft. S and 4,750 ft. E of SW cor. of Theo. Slade Sur. ..... Drlg. sticky shale 2,473 ft.
Humble Oil & Ref. Co.'s No. 13 South Texas Dev. Co., 466 ft. S and 466 ft. W of SE cor. of A. M. Folks Sur. ..... Gumbo 1,030 ft.; cmtd. surface csg.
Humble Oil & Ref. Co.'s No. 14 South Texas Dev. Co., 1,100 ft. N along NE line of T. C. Howell Sur. and thence 466 ft. westward at right angles ..... Derrick.
Humble Oil & Ref. Co.'s No. 15 South Texas Dev. Co., 1,850 ft. northward along E line of Theo. Slade Sur. from SE cor. and thence 600 ft. westward at right angles in Lot 2 ..... Drlg. shale 1,025 ft.
Humble Oil & Ref. Co.'s No. 16 South Texas Dev. Co., Theo. Slade Sur., 657 ft. S of No. 10 and 677 ft. from E line of survey ..... Derrick.
Humble Oil & Ref. Co.'s No. 17 South Texas Dev. Co., 466 ft. W of E line of Gulf Coast Drlg. & Dev. Co.'s "B" lease and 297 ft. S of N line of Theo. Slade Sur... Derrick.
Humble Oil & Ref. Co.'s No. 18 South Texas Dev. Co., 495 ft. E and 165 ft. N of NE cor. of Blk. 42, Alex McCown Sur. ..... Derrick.
Humble Oil & Ref. Co.'s No. 19 South Texas Dev. Co., 30 ft. N and 682 ft. W of SE cor. of T. C. Howell Sur.. Location.
Humble Oil & Ref Co.'s No. 20 South Texas Dev. Co., 765 ft. S and 671 ft. W of NE cor. of Theo. Slade Sur. ..... Derrick.
Humble Oil & Ref. Co.'s No. 1 Alexander, NE cor. of J. McHorse Sur. ..... Derrick.
Humble Oil & Ref. Co.'s No. 2 Cartwright, John Davis Sur., 454 ft. from S line and 928 ft. from E line out of SE cor. of tract ..... Comp. flowing 1,850 bbls. daily 5,059 ft.
Humble O. & R. Co.'s No. 3 Cartwright, John Davis Sur., 289 ft. from N line and 395 ft. from W line of Freeman 36 acres ..... Drlg. shale 5,054 ft.
Humble O. & R. Co.'s No. 4 Cartwright, John Davis Sur., 660 ft. out of NW cor. of tract ..... Drlg. shale and lime 3,959 ft.
Humble Oil & Ref. Co.'s No. 5 Cartwright, 694 ft. W and 370 ft. N of NE cor. of J. D. Watson Sur. in John Davis Sur. ..... Drlg. gumbo 1,035 ft.
Humble Oil & Ref. Co.'s No. 6-A Cartwright, John Davis Sur., 671 ft. from W line and 376 ft. from S line of lease ..... Derrick.
Humble Oil & Ref. Co.'s No. 1 Gholson & Cartwright, 512 ft. N and 300 ft. E of SW cor. of E half of John Davis Sur. ..... Drlg. gumbo 3,036 ft.
Humble O. & R. Co.'s No. 1 Plaeffiin, N. W. Real Sur., 626 ft. E and 343 ft. N of SW cor. of tract ..... Set screen 5,160 ft.; comp. flowing 1,800 bbls. daily.
Humble Oil & Ref. Co.'s No. 2 Plaeffiin, W. N. Real Sur. 671 ft. from W line and 326 ft. from N line of 110-acre tract ..... Rig.
Lilly and Red Moon Oil Co.'s No. 1 Stella McDonald, John Davis Sur., 241½ ft. from E line, 202.8 ft. from S line of 5-ac. tract ..... S.D. 916 ft.
Albert Plummer's No. 1 South Texas Dev. Co., E half of Blk. 43, Alex McCown Sur. ..... Derrick.
Rowe & Flowers' No. 1 Alexander, 330 ft. out of SE cor. Lot 26 in the NW A. McCown Sur. ..... T.D. 5,254 ft.; plugged to 5,096 ft., set 30 ft. screen; tested S.W. and some oil; standing.
Showers & Moncrief's No. 1 R. R. Dunn, M. W. Real Sur., C of N 20 acres of Moncrief 30 acres ..... Cmtd. 10¾-in. surface csg. 1,030 ft.
Southland Oil Co.'s No. 1 Cummings, Wilson Strickland Sur., 466 ft. out of NE cor. of 104-acre tract ..... Cmtd. 10-in. surface csg. 900 ft.
Steinberger et al's No. 1 Hooper, J. D. Watson Sur., 466 ft. from N line of 10-acre tract in C E and W... Fishing bit 5,044 ft.
The Texas Company's No. 1 Moody, 1,400 ft. easterly and 466 ft. southerly out of NW cor. of Moody 494-acre lease, Ranson House Sur. ..... Drlg. gumbo and lime 2,574 ft.

PORT NECHES—ORANGE COUNTY

The Texas Company's No. 2 Polk-Kuhn-Glass, 350 ft. E and 100 ft. S of SW cor. of Marshall Beauchamp Sur. ..... Drlg. sand 3,330 ft.

REFUGIO—REFUGIO COUNTY

Hewitt & Dougherty's No. 1 M. F. Lambert, Wm. Hews and L. Brown Sur., 4,350 ft. NE along NW line from SW cor. of United Prod. Corp.'s M. F. Lambert lease and thence 990 ft. SE at right angles ..... No report.
S. M. Jones' No. 1-B Mitchell (D.D.), 250 ft. NW of SE line and 250 ft. SW of Mission River ..... T.D. 9,134 ft.; plugged to 8,960 ft. D.S. test 8,910-60 ft; showed brackish wtr.; standing.
Ed Jones' No. 2 Strauch, 650 ft. from S line and 200 ft. from E line of Lot 13, Sec. 12, Refugio town tr. ..S.D. 480 ft.
T. P. Morgan's No. 2 M. F. Lambert, 993 ft. from W line and 150 ft. from S line of lease in NE cor. of town tract ..... No report.

SOUTH LOUISIANA FIELDS

JENNINGS—ACADIA PARISH

Yount Lee Oil Co.'s No. 11 Housierre-Latrielle, 1,010 ft. N and 5,050 ft. S of SW cor. of Sec. 47-9s-2w ..... Drlg. 1,625 ft.

SORRENTO—ASCENSION PARISH

Union Sulphur Co.'s No. 22 United Land Co., 5,760 ft. N and 1,360 ft. W of SE cor., Sec. 15-10s-4e..... Drlg. 4,079 ft.

IOWA—CALCASIEU AND JEFF DAVIS PARISHES

Magnolia Pet. Co.'s No. 2 Waite, 330 ft. out of NE cor. SE. Sec. 12-9s-7w ..... Drlg. shale 6,886 ft.
Shell Pet. Corp.'s No. 2 Fontenot, 225 ft. E and 325 ft. N of SW cor. of Sec. 7-9s-6w ..... Drlg. sandy shale 5,742 ft.

EDGERLY—CALCASIEU PARISH

The Texas Company's No. 1 Miller Estate, 150 ft. E and 150 ft. S of NW cor. of NE of Sec. 27-9s-11w ..... Drlg. gumbo 2,780 ft.

LOCKPORT—CALCASIEU PARISH

Union Sulphur Co.'s No. 3 Martha Moss, 300 ft. W, 150 ft. S, NE cor. NW SE, Sec. 8-10s-9w..... Set screen 6,547 ft.; comp. flowing 750 bbls. net oil, 50 per cent water.

SULPHUR—CALCASIEU PARISH

Union Sulphur Co.'s No. 750 fee (D.D.), Sec. 29-9s-10w.... Abnd. 4,820 ft.
Union Sulphur Co.'s No. 770 fee, 292 ft. S, 1,343 ft. W of center, Sec. 29-9s-10w ..... Drlg. sand 2,820 ft.
Union Sulphur Co.'s No. 772 fee, 145 ft. S, 882 ft. W of center, Sec. 29-9s-10w ..... Salt 3,968-4,061 ft.
Union Sulphur Co.'s No. 774 fee, 226 ft. W, 114 ft. S of center of Sec. 28-9s-10w..... Drlg. gumbo 2,247 ft.

VINTON—CALCASIEU PARISH

Gulf Ref. Co.'s No. 6 Gray, Sec. 33-10s-12w, 160 ft. W of No. 3 ..... Heaving shale 3,342 ft.; shut down.
Marrs McLean's No. 14 Gray, Sec. 33-10s-12w, 88 ft. W and 30 ft. S of No. 4 ..... Set 56 ft. of 4½-in. screen 2,755 ft.; tested S.W.; deepend to 2,764 ft.; reset screen.
Vinton Pet. Co.'s No. 5 Matilda Gray (D.D.), 456 ft. W, 362 ft. N, SE cor. SW NE, Sec. 33-10s-12w..... Tested S.W. 3,684 ft.; pulling screen to deepen.
Wilson-Broach's No. 2 Wilson (W.O.), 280 ft. N and 126 ft. E of SW cor. SE NE of Sec. 33-10s-12w ..... Sand showing oil 3,440 ft.; cmtd. 4½-in. liner 3,430 ft.

GUEYDAN—VERMILLION PARISH

Pure Oil Co.'s No. 3 Alliance Trust Co., 699 ft. from N line and 1,460 ft. from W line of Sec. 34-11s-1w ..... Drlg. sand and gravel 263 ft.

HACKBERRY—CAMERON PARISH

Calcasieu Oil Co.'s No. 37 Watkins, 776 ft. N and 2,267 ft. W of SE cor. of Sec. 13-12s-10w ..... Drlg. shale and lime 3,100 ft.
Wilfred Lahaye's No. 1 Olevia, Sec. 36-12s-10w, in 2-acre tract ..... Spudded and shut down.
Mills & Sless Oil Co.'s No. 1 Sun-Vincent, 300 ft. S and 75 ft. E of NW cor. NE of Sec. 30-12s-10w, in Sun Oil Co.'s 40-acre lease ..... Drlg. gumbo 2,324 ft.
Lackawanna Oil Co.'s No. 1 Ellender, 320 ft. S and 150 ft. E of NW cor. of SE SE of Sec. 21-12s-10w ..... Derrick.
Union Sulphur Co.'s No. 1 Gulf land (Pure Oil Co. lease), 1,958 ft. N, 400 ft. W of SE cor., Sec. 11-12s-10w ..... T.D. 8,324 ft.; sidetracked to 7,423 ft.; dr'll stem stuck.
Union Sulphur Co.'s No. 3 Gulf Land-Humble lease, 711 ft. N and 430 ft. W, SE cor., Sec. 11-12s-10w..... Drlg. shale 5,820 ft.
Yount Lee Oil Co.'s No. 11 School land, 2,810 ft. W and 1,608 ft. N, SE cor., Sec. 15-12s-10w ..... Shale 5,300 ft.

CHOCTAW—IBERVILLE PARISH

Standard Oil Co.'s No. 3 Myrtle Grove, Sec. 52-9s-11e, 400 ft. S and 50 ft. W of No. 1 ..... Drlg. rock 1,355 ft.

WHITE CASTLE—IBERVILLE PARISH

Shell Pet. Corp.'s No. 6 Wilbert, Sec. 9-11s-12e, 200 ft. out from No. 5 ..... T.D. 3,627 ft.; plugged to straighten hole; dry sand and shale 2,644 ft.

PORT BARRE—ST. LANDRY PARISH

Port Barre Oil Co.'s No. 1 Sibille (W.O.), Sec. 20-6n-5e, 600 ft. S and 124 ft. E, NW cor. of 30-ac. tr. .... Standing 3,494 ft.

STARKS—CALCASIEU PARISH

Emerson & Stark's No. 2 Industrial, 400 ft. S of No. 1, in SE cor. NE NW, Sec. 30-9s-12w.....Drill stem stuck 4,136 ft.
Gulf Ref. Co.'s No. 31 Lutcher-Moore, Sec. 19-9s-12w, 500 ft. E of No. 15 .....Gumbo 2,310 ft.; fishing.

SWEET LAKE—CAMERON PARISH

Pure Oil Co.'s No. 11 Yount Lee, Sec. 12-13s-8w, 800 ft. S 66 deg. 42 min. from No. 9 .....Rig.

TEXAS

MISCELLANEOUS WILDCATS

AUSTIN COUNTY

Great Southern Oil Co.'s No. 1 Schevojsa, 329 ft. N, 78° E of N cor. B. Dottery Sur. .....S.D. 2,848 ft.

BRAZORIA COUNTY

Danciger O. & R. Co.'s No. 1 W. C. Hunt, Pledger, 5,220 ft. from the N line and 6,500 ft. from E line of W. Coirson Sur. .....Drlg. hard sandy lime rock 4,635 ft.
John Deering's No. 1 C. W. Chapman, 294 ft. from S line and 104 ft. from E line of Lot 3, Andrew Robinson Sur. .....Shut down 5,003 ft.
A. D. Parsons et al's No. 1 Hughes, 1,500 varas, NE from W cor. along NW line of A. L. D. Lewis Sur., and 200 varas SE at right angles in Hughes 320-acre tract .....Spudded.
Shell Pet. Corp.'s No. 5 Blakely-Winston, Danbury, 1,410 ft. N 63° and 1,300 ft. N 27° W of SW cor. of H.T.&B. Sur. No. 14 .....Coring sand showing oil 3,645 ft.
Tri-fin Oil Co.'s No. 1 Moers, 1,635 ft. southwest of Chocolate Bayou and 693 ft. SE of NW line of F. Moore Sur. ..... No report.

BURLESON COUNTY

Ball & Knob's No. 1 Polansky, M. B. Lawrence Sur., 359 ft. from E line and 469 ft. from N line of 158-ac. tr. .....No report.
E. M. Bracey et al's No. 1 Bracey, J. Lastly Sur., 880 ft. from E cor. of P. Taylor 110 acres, SE along NE line of J. G. Houston 160 acres, thence 180 ft. at right angles in 3-acre tract .....No report.
Marek & Son's No. 3 A. Marek, N. McFaddin Sur., 1,068 ft. N and 225 ft. W of SE cor. of tract ..... Standing 2,210 ft.
Sampson Oil & Gas Co.'s No. 3 Duckworth & Gilley, P. Singleton Sur., 50 ft. SE of No. 1 .....Rig.
J. E. Stubblefield et al's No. 1 Mitchell, A. T. Woolridge Sur., 81 ft. SW and 4,340 ft. SE of S cor. of Joseph Henson Sur. ..... Gumbo 600 ft.; standing

COLORADO COUNTY

Bunte and Shell Pet. Corp.'s No. 1 Rudolph Matuska, Joshua Henneke Sur., 700 ft. S of most northerly NW cor. in C E and W of 130-acre tract .....Drlg. shale 2,965 ft.
Smith, Adair et al's No. 1 Barnett, 230 ft. from W line and 330 ft. from S line of Blk. 26, Q. K. Winn Sur....Black shale 4,345 ft.; standing

FORT BEND COUNTY

Lowrie & Young's No. 1 Jackson Brown, Pilant Lake, Wm. Barrett & Abner Harris Sur., 150 ft. out of SW cor. of Brown 1,000-acre tract .....Derrick.
Lynch et al's No. 1 Kneitz, 690 ft. from NW line and 350 ft. from SW line of Sec. 43, H.&T.C. Sur. .....Drlg. red clay 432 ft.
Magnolia Pet. Co.'s No. 1 Hampil, H. Christman Sur., 1,242 ft. N and 285 ft. W from SW cor. of J. W. Slavin 28 acres .....Drlg. surface 223 ft.
Naylor & DeCosta's No. 1 Naylor, 6,350 ft. N, 55 deg. E from SW cor. 653-acre tract in Christman Sur. .... No report.
North Star Pet. Co.'s No. 1 Guyler, Andrew Roberts Sur., 330 ft. out of SW cor. of 100-acre tract .....Drlg. sandy shale 4,010 ft.
O'Hara et al's No. 1 Mayes, N. F. Roberts Sur., 300 ft. from N line and 500 ft. from E line of M. K. Mayes' 114 acres .....Drlg. shale and lime 796 ft.
Paul & Gerke's No 1 Krenek, Gale Borden Sur., 150 ft. out of NW cor. of tract .....Derrick.

GALVESTON COUNTY

Humble Oil & Ref. Co.'s No. 1 Rosenkrans, Green's Bayou, center N half of Lot 10, Sarah White Sur.....Drlg. shale 3,716 ft.

GRIMES COUNTY

Barnett et al's No. 1 Dodd, Timothy Jones Sur. .....Shut down 2,689 ft.
W. J. Brightwell's No. 1 Combs, Samuel Beauman Sur., 350 ft. from S line and 622 ft. E of extreme W line of 276-acre tract ..... Shut down 2,690 ft.
Petroleum Southwestern Corp.'s No. 1 Greer Bros., Pat B. O'Connor Sur., 450 ft. S and 200 ft. E of SW cor. of 63-acre tract .....Derrick.

HARDIN COUNTY

W. R. Alexander et al's No. 1 Southwestern Lbr. Co., 150 varas W of C of E line of Mary K. Sherman Sur. Abnd. 3,690 ft.
Gulf Prod. Co.'s No. 1 Kirby, Ariola, 330 ft. out of SE cor. of 100-ac. tract, Ariola Sur. ..... Drlg. shale 2,876 ft.
Houston Oil Co.'s No. 1-X Ariola fee, 3,000 ft. from N line and 5,610 ft. from W line of Ariola Sur. ..... Coring sand 3,627 ft.
Houston Oil Co.'s No. 1-Y Ariola fee, 5,610 ft. from W line and 5,610 ft. from N line of Ariola Sur. .....Derrick.
Houston Oil Co.'s No. 1-Z Ariola fee, 3,000 ft. from W line and 5,610 ft. from N line of Ariola Sur. .....Spudded.
Chas. Paggi's No. 1 Hooks, 200 ft. out of NW cor. of Wm. Slade Sur. .....No report.
Joe E. Proctor's No. 1 Russell & Teagle, 3,650 ft. E and 2,777 ft. N of NW cor. of Wm. W. Young Sur. .....S.D. 2,465 ft.
Republic Prod. Co.'s No. 2 Ariola fee, Ariola Sur., 660 ft. due E of Gulf's No. 1-A Kirby .....Spudded.
Republic Prod. Co.'s No. 3 Ariola fee, Ariola Sur., 660 ft. due S of Gulf's No. 1-A Kirby .....Derrick.
Republic Prod. Co.'s No. 1 Ben Andrews fee, 1,140 ft. W of Neches River and 345 ft. N at right angles in Van Meter Sur. .....Derrick.

HARRIS COUNTY

Bayou Oil Co.'s No. 1 Hall, 350 ft. from N line and 970 ft. from E line of Wm. Hedge Sur. ..... Drlg. sand and shale 4,956 ft.
T. V. Buckholve & Sons' No. 1 Miller, Arthur McCormick Sur. ..... Drlg. gumbo 1,115 ft.
Cherry & Pritchard's No. 1 Dr. Griffith, S. Bell Sur., 582 ft. from E line and 60 ft. from N line of 250-acre tract .....T.D. 756 ft.; cmtd. 10-in. csg. 659 ft.
John Deering's No. 1 Warren, Hockley T. Snell Sur., 100 ft. due south of The Texas Co.'s No. 3 Warren. S.D. 2,411 ft.
Koinm Prod. Co.'s No. 1 Burt & Griffith, 2,100 ft. W of E line of A. R. Bowman Sur. and 2,600 ft. S of Spring Creek .....Drlg. gumbo 832 ft.
W. D. Morse et al's No. 1 Schiveinle, Wm. White Sur., 900 ft. S 80° W of NW cor. of Lienberger 20-ac. tract in Blk. 1 ..... Shut down 3,612 ft.
John R. Turnbull's No. 1 Laureman, 569 varas E and 315 varas S of NW cor. of W. B. Bissonett Sur. .....Drlg. shale 4,864 ft.

JASPER COUNTY

Gulf Prod. Co.'s No. 1 Miller Vidor, 2,393 ft. S and 112 ft. E of NW cor. of Sarah Gray Sur. .....Rig.
West Drlg. Co.'s No. 1 Flourney, B. F. Jones Sur., 900 ft. NW of Helmerich & Payne's No. 1 Flourney ..... Shut down 4,521 ft.
Houston Oil Co.'s No. 1 Richardson fee, 2,000 ft. S and 3,003 ft. W of NE cor. of Ben Richardson Sur. .....Rig.
P. Michael et al's No. 1 Eck, G.C.&S.F. Sur., 502 ft. from N line and 497 ft from E line of tr. .....Drlg. sandy shale 1,609 ft.

JEFFERSON COUNTY

Coastal Oil & Gas Co.'s No. 1 Young, Joseph Grigsby Sur., 250 ft. from E line and 160 ft. from S line of 40-acre tract in Block F-5, Lot 6 .....Temp. abnd. 2,450 ft.
Elam & Pipkin's No. 2 Broussard, John McGaffey Sur., 150 ft. due E of No. 1 .....Shut down 1,855 ft.
Jack Schultz' No. 2 Todd, Cheek, 1,800 ft. S of No. 1 and 130 ft. E of W line of Wm. Carr Sur. .....Cmtd. 9⅝-in. csg. 4,034 ft.

LIBERTY COUNTY

Leon Brisley's No. 1 J. M. Neal, Edward Tanner Sur., 1,800 ft. E, 1,300 ft. N of most westerly NW cor. of Margaret Evans Sur. .....Drlg. sand and lime 2,314 ft.
Mayes et al's No. 1 Dunman, J. C. Martin Sur., 1,111 ft. from S line of survey and 2,360 ft. W of Trinity River .....Rig.

MATAGORDA COUNTY

Danciger O. & R. Co.'s No. 1 Turner, 4,900 ft. from NE line and 3,800 ft. from SE line of M. Cummings Sur. .....Surface clay 30 ft.; derrick down.
Dr. Griffith et al's No. 3 Baer, Big Hill, 5,000 ft. N, 1,000 ft. E from SW cor. of Seth Ingram Sur. .....Standing 2,720 ft.
Rugeley et al's No. 1 Cleveland, E. Hall Sur., 450 ft. E of Cottonwood Creek and 200 ft. N of S line of 60-acre tract .....Drlg. gumbo 525 ft.

MONTGOMERY COUNTY

Miller Prod. Co.'s No. 1 Foster Lbr. Co., M. B. Lawrence Sur., 2,640 ft. from N line and 300 ft. from E line of 412-acre tract .....Shut down 4,020 ft.
Pevehouse Oil Co.'s No. 1 Sealey, Jas. Pevehouse Sur., 1,575 ft. N of N line of Horton & Woodson's 1,562-acre tract and 2,226 ft. E of W line of H.&W. 1,870-acre tract .....Shut down 3,984 ft.
Rheubotham et al's No. 1 A. H. Salis, Wm. Barker Sur., 390 ft. from E line and 400 ft. from N line of W 36 acres of Salis tract .....Rig.
Sutton-Hawkins' No. 1 Foster, Rosea de la Garza Sur., 3,333 ft. N and 1,320 ft. E of NE cor. of W. J. Johnson 100-ac. tract .....Drlg. shale 3,006 ft.

NEWTON COUNTY

L. A. James et al's No. 1 Price, T.&N.O. Sur., 1,000 ft. from W line and 500 ft. from N line of tract .....Shut down 1,205 ft.
Sun Oil Co.'s No. 1 Peevey Moore Lbr. Co., 2,145 ft. from S line and 1,225 ft. from W line of F. Stoevar Sur. No. 4 .....Drlg. shale 5,395 ft.

POLK COUNTY

Anderson et al's No. 1 Duke, Peter J. Manard Sur., 330 ft. out of NW cor. of 235-acre tract .....Cmtd. 10-in. csg. 755 ft.; standing.
Coch & Stevens' No. 1 Ruth Lawrence, Castillian Sur., 300 ft. from W line and 790 ft. from S line of 54-acre tract .....S.D. 1,169 ft.
Dick Schwabb's No. 1 Carlton Davis, A. Viesca Sur., 350 ft. out of most northerly SE cor. A. E. Munson 101-acre tract .....Drlg. gumbo 3,149 ft.
Tony & Purdy's No. 1 Martha Roberts, Joaquin T. De Rumayor Sur. .....Spudded and shut down.
G. A. Williams et al's No. 1 Carlton-Davis, 300 ft. E and N out of SW cor. of L&G.N. Sur. No. 52 in 55-ac. tr. .....Drlg. sticky shale 3,602 ft.

REFUGIO COUNTY

Humble Oil & Ref. Co.'s No. 3 O'Connor, Florentine Rice Sur., 13,757 ft. from S line at right angles and 3,412 ft. from E line at right angles of 5,545-acre ranch .....Rig.

SAN JACINTO COUNTY

Geo. L. Pace and Ed. C. Lawson's No. 1 Delta Land & Lbr. Co., H.&T.C. Sur. No. 3, 2,640 ft. from E line and 1,940 ft. from S line of Sur. .....Drlg. shale 3,081 ft.
Weaver et al's No. 1 Delta Land & Timber Co., 1,400 ft. NE of SW line of James W. Robertson Sur., and 800 ft. at right angles .....Derrick.

TYLER COUNTY

Allied Pet. Co.'s No. 3 Wilson, 1,500 varas from W line and 600 varas from N line of Mrs. E. Cheny Sur., Abst. 798 .....T.D. 5,146 ft.; trying to pull 3-in. drill pipe.
Republic Prod. Co. and Houston Oil Co.'s No. 1 fee, 8,384 ft. from W line and 484 ft. from N line of Adolph Sterne Sur. .....Sand 4,698-4,708 ft.; drill stem test 4,675 ft.; est. 30,000,000 ft. dry gas, 750 lbs. pressure, ¾-in. choke; to set casing.

VICTORIA COUNTY

Houston Oil Co.'s No. 1-A McFaddin, 200 ft. from NE line, 240 ft. from SE line of I.R.R. Sur. No. 20 ....Heaving shale 6,480 ft.
Humble Oil & Ref. Co.'s No. 1 Pete Rydolph, John Kemper Sur., 2,617 ft. from E line and 1,013 ft. from W line of lease ..... Drlg. shale 6,028 ft.
Slick-Seeligson Corp.'s No. 2 McFaddin (D.D.), J. Varian Sur., 1,100 ft. NE of SW line and 635 ft. E of railroad .....No report.
The Texas Company's No. 3 McFaddin (W.O.), S 15° W 6,200 ft., N 75° W 1,850 ft. from NE cor. John M. Rine Sur. .....Drlg. sand and shale 6,867 ft.
Union Oil Co.'s No. 1 Keeran, 4,166 ft. SW along SE line of Gulf Prod. Co.'s 2,500-ac. lease from most easterly cor., thence 1,390 ft. SE at right angles in Martin DeLeon Sur. ..... Drlg. hard sand 6,595 ft.

WALKER COUNTY

W. E. Brown's No. 1 Horshall, 150 ft. out of SE cor. of E. Miller Sur. .....Shut down 3,600 ft.
Hart Oil Co.'s No. 1 Thompson Lbr. Co., Jose Ortega Sur., 1,265 ft. S, 1,876 ft. W of SW cor. of J. B. Gibson's 71-acre tract .....Shut down 2,090 ft.

WALLER COUNTY

Bancho Oil Co. and Jim Oil Co.'s No. 1 Joe W. Harris, 3,000 ft. from E line and 5,000 ft. from N line of H.&T.C. Sur. in Harris 1,475-acre lease in Justo Liendo Sur. .....Location.

WASHINGTON COUNTY

M.O.&T. Corp.'s No. 1 Giddings, S. Young Sur., 200 ft. from S line and 150 ft. from W line of 698-acre tract .....Shut down 65 ft.

WHARTON COUNTY

Gantt et al's No. 1 Laura Hahn, N. Manch Sur., 330 ft. out of NE cor. 142.17-ac. tract .....Shut down 3,315 rt.
Smith & Donnald's No. 1 Mitchell, H.&T.C. Sur. No. 8, 330 from NE line of NE 80-acre tract in C of tract NW and SE .....Drlg. shale 2,647 ft.

SOUTH LOUISIANA

ASCENSION PARISH

Rio Bravo Oil Co.'s No. 1 Community Lease, Darrow, 200 ft. from N line and 1,500 ft. E at right angles from SW cor. of Sec. 15-10s-2e .....Set 29 ft. of 7-in. screen 4,035 ft.; flowed 490 bbls. P.L. oil in 10 hrs., ¼-in. choke, 436 lbs. pressure; shut in for storage; shut-in pressure 375 lbs.

BEAUREGARD PARISH

DeRidder Dev. Co.'s No. 1 McMahon, 200 ft. W and 156 ft. S of NE cor. of NW of Sec. 33-3s-9w .....Standing 1,286 ft.

CALCASIEU PARISH

Cannon & Hughes' No. 1 J. S. Reed, Sec. 18-10s-12w...Derrick.
I. R. Irvine et al's No. 1 A. D. Mimma, 741 ft. N and 741 ft. W of SE cor. SE NE, Sec. 20-9s-7w.....Shut down 745 ft.

JEFFERSON DAVIS PARISH

B. D. Finly's No. 1 Clarphy Lognion, SW NW of Sec. 22-10n-4w .....Derrick.

PLAQUEMINES PARISH

Lake Washington-Freeport Sulphur Co.'s No. 3 Cockrell-Moran, 5,100 ft. E and 1,000 ft. S of Washington Station, Sec. 14-20s-26e .....Sulphur test.
Lake Washington-Freeport Sulphur Co.'s No. 4 Cockrell-Moran, 3,200 ft. S and 2,950 ft. E of Washington Station, Sec. 14-20s-26e .....Sulphur test.

Lake Washington-Freeport Sulphur Co.'s No. 5 Cockrell-Moran, 5,200 ft. E and 850 ft. N of Washington Station, Sec. 14-20s ..... Sulphur test.
The Texas Co.'s No. 5 Garden Island Bay, 2,180 ft. W and 1,750 ft. S, NE cor., Sec. 107-23s-32e..... Drlg. 720 ft.

TERREBONNE PARISH

The Texas Company's No. 6 State-Dog Lake, 3,230 ft. W and 908 ft. N of SE cor. of Sec. 31-21s-15e ..... Drlg. rock 2,147 ft.
The Texas Company's No. 7 State-Lake Pelto, 2,216 ft. N, 104 ft. W of SE cor., Sec. 8-23s-15e ..... Drlg. 982 ft.
The Texas Company's No. 17 State-Lake Barre, 1,476 ft. W and 626 ft. S of NW cor. of Sec. 20-21s-20e ..... Drlg. rock 2,025 ft.
The Texas Company's No. 4 Lake Barre-L.L.&E., 3,803 ft. S and 2,075 ft. W of NW cor. of Sec. 30-21s-20e in Sec. 36-21s-19e ..... Bldg. derrick.

VERNON PARISH

Minerals Division Iiano Co.'s No. 1 Llano Del Rio, 543 ft. E and 300 ft. S of NW cor. of NW of Sec. 34-2n-9w ..... Drlg. 1,726 ft.

WEST FELICIANA PARISH

Putnam Synd.'s No. 8 Como Plantation, Sec. 51-1s-14w. Shut down 2,449 ft

Wildcat Operations in Southwest Texas

(Continued from Page 83)

S. W. Blount's No. 1-A S. A. Land & Dev. Co., 10 ft. from No. 1 in I. Peres Sur. ..... T.D. 965 ft.; moving in rotary
Robert C. Hill's No. 1 Schell, 1,300 ft. from N line, 1,100 ft. from W line of 161-ac. tract in Sec. 234, Perretaux Sur. ..... Drgl. 458 ft.
Rollin V. Hill, Sr.'s No. 1 Max Boeck, 1,700 ft. from N line, 2,700 ft. from E line of tract in J. R. Shepherd Sur. ..... T.D. 150 ft.; S.D. acct. rain.
Kistler's No. 1 Emma Pierce, 1,550 ft. from NW cor. and 350 ft. SE of SW lines of 49½ acres in Cortaris Sur. No. 1 ..... Location.
Linda Oil Co.'s No. 1 John and R. S. Watson, 600 ft. from S line, 150 ft. from E line of 200.7-ac. tract in Cruise Landin Sur. ..... T.D. 1,360 ft.; drlg.
Moore-Jauer's No. 1 Holly R. Ellison, 2,916 ft. from E line, 1,500 ft. from S line of farm in T. York Sur... T.D. 2,170 ft.; abnd.; pulled csg.
Dr. Ewell Neil's No. 1 J. Watson, 500 ft. from W line, 1,700 ft. from S line of B. Martines Sur. ..... T.D. 2,495 ft.; in Edwards dr?
Jones & Voltz' No. 1 Bonkowsky, 150 ft. to N and W lines of William McMenenes Sur., 12 miles E of San Antonio ..... T.D. 907 ft.; standing.
Linda Oil Co.'s No. 1 Watson, 150 ft. from E line, 600 ft. from S line of tract in Cruz Landin Sur. .. .. T.D. 1,360 ft.; drlg. in gumbo.
Schneider, Rees et al's No. 2 Claussen, 12 miles NE of San Antonio ..... T.D. 1,330 ft.; S.D.
M. E. Trussell's No. 1 L. B. Carruthers, Sr., 2,000 ft. from W line, 400 ft. from most easterly N line of tract in Sam McCullough Sur. ..... T.D. 896 ft.; bailing, showing oil.

BLANCO COUNTY

Hardy Sitton's No. 1 Luders, 150 ft. from S line, 1,420 ft. from E line of James Stanford Sur. ..... T.D. 1,540 ft.; resumed drlg.

BROOKS COUNTY

M. P. Evans' No. 1 J. M. Martinez, 200 ft. from N and W lines of Blk. 11, Sec. 6, La Encantada Sur. ..... T.D. 1,480 ft.; standing.

CALDWELL COUNTY

Cargill et al's No. 1 Dameron, 150 ft. from N and W lines of 73-5-ac. tract in Dillard Cooper Sur. ..... T.D. 1,100 ft.; standing.
E. D. Herne's No. 1 M. C. and P. W. Jeffrey 126-ac. tract, 150 ft. from N and E lines of tract in James George Sur. ..... Set surface pipe, waiting for wir

COMAL COUNTY

Caldwell & M. Lanier's No. 1 T. J. Byler, 175 varas from W line, 370 varas from N line of 320-acre tract in H.E.&W.T. Sur., Sec. 894 ..... T.D. 887 ft.; drlg.

DIMMITT COUNTY

Motes-Campbell Co.'s No. 1 Denton, 150 ft. from E line, 250 ft. from S line of Tracts 33 and 34 in Sec. 60 of Denton Colony Subd. ..... T.D. 400 ft.; waiting for csg.

DUVAL COUNTY

J. E. Anderson's No. 1 Wood-Welder, 115 ft. from W line, 400 ft. from N line of Sur. No. 71 ..... T.D. 600 ft.; drlg.
Buchanan & Terrell's No. 1 Duval County Ranch Co., 990 ft. to W line, 1,120 ft. to S line of Sur. No. 96.. Location.
Delange & Frates' No. 1 Sevier, 1,845 ft. from N line, 2,946 ft. from W line of Sur. 213 ..... T.D. 2,707 ft.; drlg.
Duggan & Smith's No. 2 Sutherland, 330 ft. from S and W lines of Sur. No. 511 ..... T.D. 800 ft.; drlg.
Frank Gravis' No. 3 Schallert in Sur. 255 (Palangano salt dome) ..... T.D. 1,403 ft.; set csg. to test.
Highland Oil Co.'s No. 1 Peters, 330 ft. from N and E lines of NE SE of Sur. 178 ..... Abnd., reported in error.
J. A. Leindecker's No. 1 G. W. Sutherland, 560 ft. from S line, 450 ft. from W line of Survey No. 183 ..... Spudded in and S.D.
Payne & Vernon's No. 1 A. Roach, 865 ft. from E line, 45 ft. from S line of Blk. 7, Sur. No. 457 ..... Rigged up.
Plymouth Oil Co.'s No. 1 Hoffman, center of Sur. 113 .... Rigged up.
Smith & Capps' No. 1 Peters, 330 ft. from S line, 340 ft. from W line of NE of Sur. No. 178 ..... Rigging up.
Sun Oil Co.'s No. 1, 1,650 ft. to N and W lines of Sur. No. 78, or 330 ft. to S and W lines of E half of NW of Sur. No. 76 ..... Location.

FRIO COUNTY

Amerada Pet. Corp.'s No. 1 Halff & Oppenheimer, 1,200 ft. from N line, 200 ft. from E line of W. F. Halsel Sur. ..... T.D. 3,250 ft.; drlg.

GUADALUPE COUNTY

B. E. Brock's No. 1 Ogletree, 1,600 ft. from W line, 450 ft. from S line of tract in Robert Smith Sur. .... T.D. 1,860 ft.; S.D.
Keene & Russell's No. 1 Lowman, 300 ft. from E line, 350 ft. from N line of tract in George Allen Sur. ... T.D. 380 ft.; S.D.
H. A. Suttle's No. 1 O. J. Halm, 150 ft. from N line, 1,900 ft. from E line of 331-acre tract in J. Kent Sur. ..... T.D. 1,785 ft.; drlg., no chalk.
J. T. Stover's No. 1 Paul Hiffman, 1 mile SW of Salmar Pool ..... T.D. 1,775 ft.; drlg. broken formation.
F. W. Tong's No. 1 Henry Rahe, 650 ft. to SW lines, 1,300 ft. to NW lines, Moses Baker Sur. ..... Moving in machinery.

GOLIAD COUNTY

Hoffman & Gooch's No. 1 Fromme, 600 ft. from N and 1,200 ft. from W line of Peter B. Dexter Sur. ..... T.D. 2,470 ft.; standing.
Rowan & Hope and Phillips Pet. Co.'s No. 1 Irby, 6,500 ft. from E line, 3,000 ft. from N line of 2,080-ac. tract in Ybarbo Sur. ..... T.D. 3,535 ft.; drlg.

GONZALES COUNTY

Luling Oil & Gas Co.'s No. 1 J. L. Dubose, 870 ft. from S line, 450 ft. from E line of 100-ac. tract out of 295-ac. tract in F. R. Whitner Sur. ..... T.D. 3,260 ft.; abnd., showed little gas.
Edmiston & Kirby Pet. Co.'s No. 1 J. W. Ward, Jr., 300 ft. from N line, 833 ft. from W line of tract in Dan McKay Sur. ..... T.D. 1,592 ft.; standing.
Kirby Pet. Co. and Bennett's No. 1 Lum & Boulder, 1,100 ft. to SE lines, 100 ft. to SW lines, Russell Ward Sur. ..... Spudded in for Edwards lime test.

HIDALGO COUNTY

Barrett-Kanellos' No. 1 J. B. Brock, 7 miles W and N from Mission (on Monte Cristo road) ..... T.D. 4,590 ft.; S.D.
Palm City Pet. Co.'s No. 1 J. T. Lomax, 7,500 ft. from S and E lines of San Roman Sur. .. .. T.D. 1,445 ft.; drlg.
Dayle L. Smith's No. 3 Daskam, SW part of county ..... T.D. 1,726 ft.; S.D

JIM HOGG COUNTY

Clark & Cowden's No. 1 E. Vela, Share 1 El Peyote grant. Rigging up.
Cole Pet. Co.'s No. 1 W. Allen, 990 ft. to E line, 1,320 ft. to N line of Blk. 13, Randado grant ..... Location.
D. C. DeWitt's No. 1 Gomez, 1,110 ft. from N line, 150 ft. from W line of Sur. No. 12, SW part of county ... T.D. 1,457 ft.; to drill deeper.
Jack Tarver's No. 1 Martinez, 300 ft. from E line, 1,600 ft. from N line of Sur. No. 623 ..... T.D. 2,800 ft.; reaming.

JIM WELLS COUNTY

Crawford et al's No. 1 Hoffman, 1,980 ft. N and 660 ft. W of most easterly SE cor. of Hoffman 7,000-ac. tract in La Trinidad grant ..... T.D. 2,130 ft.; drlg.
J. A. Lain's No. 1 Vernon Porter, 800 ft. from S line, 400 ft. from W line of 200-ac. tract in Sur. 25 ..... T.D. 1,158 ft.; coring sand.

KARNES COUNTY

A. E. Edmiston's No. 1 O. L. Cochran, 150 ft. from S line, 500 ft. from E line of farm in D. B. McConnell Sur. ..... T.D. 2,014 ft.; drlg. at 1,600 ft. in sidetracked hole.

KERR COUNTY

Eastland Oil Co.'s No. 1 Love, 600 ft. E of Evans & Gant's No. 1 Love in Sur. No. 1,594 ..... T.D. 3,505 ft.; abnd.
Evans & Gant's No. 1 Estelle Young, 150 ft. out of NW cor. of Sec. 28, E. A. Burge Sur. ..... T.D. 1,310 ft.; standing.
Verde Oil & Gas Co.'s No. 1 J. D. Witt, 1,320 ft. from N line, 1,220 ft. from W line of Sec. 1,923 in Hamilton Sur. ..... T.D. 110 ft.; standing.

KLEBERG COUNTY

H. Carter's No. 1 R. H. Simmons, 150 ft. from S and W lines of tract in Sec. 7, King Sur. No. 3 ..... T.D. 3,205 ft.; resuming drlg.
Harris et al's No. 1 Dennett, north of Kingsville Field .. Spudded in and set surface csg.

LIVE OAK COUNTY

J. H. Durbin's No. 1 Marbach, 1,900 ft. from W line, 425 ft. from SE line of tract in S. Hayes Sur. ..... T.D. 900 ft.; fishing.
J. A. Harper's No. 1 fee, 2,130 ft. to N line, 510 ft. to E line of farm, J. Pointevant Sur. 37 ..... T.D. 1,100 ft.; showing oil, wtg on csg.

LEE COUNTY

Paton Bros.' No. 1 Turner, 150 ft. due SE of No. 1-A Turner, junked at 5,675 ft. in the David Hudson Sur., 2 miles SE from Tanglewood ..... Location.

McMULLEN COUNTY

Jaqua & Crow's No. 1 Hagist, 330 ft. from N and W lines of R. W. Mills Sur. No. 467 ..... Spudded in.

MEDINA COUNTY

James E. Greenlea's No. 1 Feasler, 600 ft. from N line and 2,400 ft. from E line of L. G. Harrison Sur. No. 799 ..... Spudded in.
Robertson Drilling Co.'s No. 1 Little, 2,350 ft. from N line, 1,500 ft. from E line of E. B. Rutledge Sur., southern part of county ..... T.D. 3,105 ft.; drlg. in Edwards, said to show oil.
F. Ryal's No. 1 G. Martin, 150 ft. from S and W lines of Blk. 368, H. Castro Sur. ..... Spudded in and S.D.

MILAM COUNTY

Bridwell's No. 1 Terry, 1,100 ft. from N line, 800 ft. from W line of tract in Jose Leal Sur. ..... T.D. 750 ft.; drlg.
M. W. Eiser's No. 1 Citizen's Nat. Bank of Waco, 1,325 ft. from S line, 625 ft. from E and W lines of tract in Wm. Punchard Sur. ..... T.D. 1,842 ft.; reaming at 1,800 ft.
Glass et al's No. 1 Ellison, 700 ft. from N line, 1,350 ft. from W line of 200-acre tract in Samuel Frost Sur. .. T.D. 1,610 ft.; S.D.
Huff & Keck's No. 1 J. W. Lee, 1,200 ft. to E line, 265 ft. to S line, D. Harmon Sur. ..... T.D. 1,400 ft.; drlg.
Keyser & Roberts' No. 2 Ward, 125 ft. NE of No. 2 Ward, in Levi Taylor Sur. ..... T.D. 1,343 ft.; abnd.
Michalk & Clark's No. 1 Johnson, 60 ft. S of No. 1 Johnson on 100-ac. lease in Juan Jose Acosta Sur. .. T.D. 2,280 ft.; S.D.
M. C. Moore et al's No. 1 H. A. Camp, east of San Gabriel ..... T.D. 1,070 ft.; drlg. broken chalk and Serpentine.
Wilder, Van Huss & Ediston's No. 1 Von Groton in M. J. Delgado Sur. ..... T.D. 2,857 ft.; S.D.

NUECES COUNTY

Gulf Port Oil Co.'s No. 1 Luby, 2,044 ft. from E line, 2,142 ft. from S line of John M. Luby, 531.74 acres, Blk. 1 of Mary J. Luby Share 1-G of Anna Collins Petronilla pasture, 24 miles SW from Corpus Christi. T.D. 350 ft.; drlg.

STARR COUNTY

Adams & Modest's No. 1 Wood, 2,070 ft. from W line of Porcion 84, Camargo, and 1,472 ft. N of Missouri Pacific Railroad ..... Derrick.
Hartshorn et al's No. 1 Hinijosa, 835 ft. W of Hebbronville road and 2,500 ft. from S line of Porcion 110... Location.
B.&B. Oil Co.'s No. 1 Crown Brick & Tile Co., 1,800 ft. S of State Highway No. 4 and 580 ft. from W line of Porcion 87, near La Puerta ..... Rigging up.
D. H. Carpenter's No. 1 Salinas, 3,087 ft. from N line, 1,221 ft. from E line of Share 85 of partition of Porcions 38, 39, 40 in jurisdiction of Reynosa ..... Rigging up.
W. P. Chancellor's No. 1 A. Guerra, 24,000 ft. N of SW cor. and 2,600 ft. from W line of Share 6 in the Joe Grant Sur. ..... Rigging up.
Coastal O. & G. Co.'s No. 1 Kelsey Bass, 448 ft. to N line, 150 ft. to W line of Tract 52, Sur. 2, Porcion 86. T.D. 1,700 ft.; drlg.
L. W. Connor's No. 1 Sanchez, cen. of Sur. 344 ..... Waiting on water line.
W. T. Gilman & Travelers Oil Co.'s No. 1 C. Ramos, 1,170 ft. from SW line, 1,470 ft. from NW lines of Sur. No. 150 ..... Spudded in and S.D.
H. C. Harter's No. 1 Gonzales, 990 ft. from N line, 1,150 ft. from E line of Share 62-B of Subd. of Porciones 70 and 71, Jurisdiction Mier ..... T.D. 410 ft.; standing.
Jeffries and Lambeth Drilling Co.'s No. 1 Starr County Cattle Co., 11,572 ft. from N line, 2,490 ft. from E line of Porcion 89, Jurisdiction of Camargo ..... T.D. 800 ft.; resumed drlg.
LaJoya Oil & Gas Co., making location in Porcion 29 in NE part of county ..... Location.
Morrison et al's No. 1 V. G. Guerra, 1,980 ft. from SW line, 450 ft. from SE line of Sur. No. 23 ..... T.D. 400 ft.; drlg.
John Pope, trustee's No. 2 H. Gonzales, 150 ft. W of cen. of E line of Sur. No. 339 ..... Location.
Smith et al's No. 1 Lopez, 200 ft. from E line, 1,000 ft. from S line of Blk. 20, Share 65 of Porcion 80, Jurisdiction Camargo ..... T.D. 1,515 ft.; drlg.
E. L. Williams' No. 1 L. G. Madrigal, 150 ft. from N and W lines of Share 5-A of Porcion 72 of Jurisdiction of Mier ..... T.D. 332 ft.; drlg.
George Stobaugh's No. 1 Seabury et al, 150 ft. from S and W lines of Porcion 107 ..... TD. 278 ft.; no report.

TRAVIS COUNTY

Fritz Fuchs' No. 1 Swedish, 2,350 ft. from NE line, 750 ft. from NW line of Thomas Smith Sur. ..... T.D. 1,788 ft.; S.D.
Ray & Orth's No. 1 Lundgren, 550 ft. from N line, 150 ft. from W line of 133-ac. tract in L. Kimbro Sur. .. T.D. 787 ft.; abnd.

WEBB COUNTY

Blair & Livingston's No. 1 J. M. Garcia, 150 ft. from N and E lines of NE NW of Sur. 1,100 ..... Location abnd.
O. W. Killam's No. 1 E. Garcia, center Blk. 2, Blk. 2 Sur. 461, W from Mirando City ..... T.D. 1,771 ft.; drlg.
Newton Drilling Co.'s No. 1 A. Garcia, 2,550 ft. from S line, 2,340 ft. from W line of Sur. No. 52, 2 miles SW of Carolina Texas Field ..... T.D. 2,080 ft.; drlg., shows oil.
Thompkins et al's No. 1 Ortiz, 200 ft. from E line, 2,000 ft. from N line of Sur. No. 1,808 ..... T.D. 930 ft.; abnd.

WILLIAMSON COUNTY

Burns et al's No. 1 E. G. Edge, 350 ft. from SE line, 267 ft. from SW line of 94-acre tract on Simon Miller Sur. ..... T.D. 2,320 ft. abnd.
McLean et al's No. 2 R. C. Miller, 800 ft. to S line, 100 ft. to W line of tract in B. Manlove Sur. ..... T.D. 740 ft.; S.D.
McNeil & Orth's No. 1 Joe Littleton, 800 ft. to W line, 150 ft. to N line, H. Good Sur. ..... T.D. 1,520 ft.; abnd.
M. L. Vaughn's No. 1 Merrell, 300 ft. from S line, 500 ft. from E line of tract in G. W. Glasscock Sur. ..... Location abnd.

ZAPATA COUNTY

Donchoo et al's No. 1-A Garcia, 150 ft. from NE and SE lines of Blk. 7 of Subd. of 700-ac. of Share A, Charco Redondo grant ..... T.D. 1,003 ft.; no report.
Huff & Fudge's No. 1 Uribe, 150 ft. from NW and SW lines of Blk. 8, Share 7, Partition 6, San Ignacio Subd. of Borrego grant ..... T.D. 300 ft.; standing.
Hunt & Polk's No. 1 H. Ramirez, 7,075 ft. N of S cor. and 2,918 ft. from W line of Share A of Villa grant .. T.D. 860 ft.; standing.
F. J. Ossenbeck's No. 1 Adelfonso Rameriz, 600 ft. W of Zapata-Roma highway, 150 ft. from SE line of Porcion 18 ..... Location.
H. L. Sargent et al's No. 1 Antonio Gutierrez heirs, 922 ft. from W line, 472 ft. from S line of Tract 2, Blk. 5, Nixon Subd., Porcion 10, San Ignacio Borrego grant ..... T.D. 1,312 ft.; drlg.
Stevens & Pope's No. 1 Martinez, 150 ft. from S and E lines of Blk. 95, C. H. Sprague Subd. of Sur. 434 .... T.D. 262 ft.; drlg.
Winch & Billings' No. 1 S. Benavides, 1,018 ft. from NW line, 1,107 ft. from NE line of Blk. 2 of O'Hern & Fansler Sub. of Villa grant ..... Rigged up.

Southwest Texas Proven Areas

Week Ending October 1

NORMANNA POOL—BEE COUNTY

Gulf Coast Oil Co.'s No. 5 Hicks, 600 ft. E of Nichols Oil Co.'s No. 2 Hicks ..... Derrick.
Wallace Morgan's No. 1 Scott, half mile E of Normanna Pool ..... Making location.

NORTH PETTUS POOL—BEE COUNTY

Gulf Port Oil Co.'s No. 5 McKinney, 660 ft. due NE of No. 4 ..... T.D. 2,900 ft.; drlg.

TULETA POOL—BEE COUNTY

O'Neil and C.R.M.'s No. 1-A Harris, 150 ft. from N and W lines of SW SE Sec. 2 of Ragsley Sub. of Uranga grant ..... T.D. 4,096 ft.; tested mud and oil, setting csg.
Nichols and C. R. & M. Drilling Co.'s No. 3 Harris in center of Blk. 10, Sec. 13, Ragsley Subd. of Urabga grant ..... T.D. 1,700 ft.; drlg.
Nichols and C.R.M. Drlg. Co.'s No. 2 Harris, 250 ft. from S and E lines of Blk. 7, Sec. 2 of Ragsley Subd. of Uranga Sur. ..... Rigging up.
The Texas Company's No. 2 Cox, 250 ft. from S and W lines of SE of SW of SW of Sec. 2, Ragsley Subd. of Uranga tract ..... **Location.**

GAS RIDGE—BEXAR COUNTY

American Gas Co.'s No. 5 W. H. Kennon, 1,760 ft. from S line, 2,000 ft. from E line of 400-acre tract in Maria F. Rodrigues Sur. ..... T.D. 2,230 ft.; to set csg.

ECKERT POOL—BEXAR COUNTY

Alamo Nat. Gas Co.'s No. 3 J. H. Gembler, 180 ft. from N and E lines of tract in A. Manachaca Sur. 51. T.D. 1,416 ft.; drlg.
E. M. Carl's No. 1 F. Gembler, 160 ft. from N line, 750 ft. from E line of tract in J. Montez Sur. ..... T.D. 825 ft.; moving in heavy rig
Gatlin Oil Co.'s No. 15 I. A. Beck, 150 ft. from S and E lines of tract in J. Montez Sur. ..... Location.
W. R. Swearingen's No. 11 Halbardier, 400 ft. SE of No. 10 Halbardier, J. F. Perez Sur ..... Location.

ALTA MESA POOL—BROOKS COUNTY

Ed East's No. 3 Randolph Garcia, 1,000 ft. from S line, 200 ft. from W line of 2,161-ac. tract in La Escantada grant ..... T.D. 100 ft.; drlg.

DUNLAP POOL—CALDWELL COUNTY

Bob Rose's No. 2-B Walker 46-acre tract, 360 ft. from NW line, 500 ft. from SW line of tract in Solomon Seal Sur. ..... T.D. 2,199 ft.; swabbing.

SALT FLATS—CALDWELL COUNTY

Hickman et al's No. 1 C. A. Dickerson, 150 ft. N of cen. of S line of tract in John D. Rains Sur. ..... T.D. 2,172 ft.; drlg. deeper.

WEBSTER POOL—CALDWELL COUNTY

C. J. Webster Oil & Gas Co.'s No. 1 C. F. Robertson, 700 ft. from E line, 200 ft. from N line of 100-ac. tract, John A. Neill Sur. ..... Derrick.

NORTH GOVERNMENT WELLS—DUVAL COUNTY

R. B. Byrd's No. 3 Wright, 660 ft. from W line, 330 ft. from N line of Sur. No. 101 ..... Location.
H. H. Coffield's No. 3 Wendt, 150 ft. from N and E lines of SE of NE of Sur. No. 43 ..... T.D. 2,314 ft.; comp. 15 bbls. hr.
Hamill & Hamill's No. 2 C. W. Hahl, 330 ft. to N and W lines of N half of SE of Sur. No. 42. ..... Location.
Highland Oil Co.'s No. 1 Lundell, 330 ft. from S and W lines of S half of NE of Sur. No. 42 ..... T.D. 2,263 ft.; 1,000 bbls.
Magnolia Pet. Co.'s No. 8 G. Wendt, 150 ft. from N and W lines of SW NW Sur. No. 44 ..... T.D. 2,310 ft.; comp. 30 bbls. hr.
Magnolia Pet. Co.'s No. 1 J. V. Aiken, 330 ft. to N and W lines of S half of SE of Sur. 42 ..... Rigging up.
San Diego Oil Corp.'s No. 2 L. Bennett, 500 ft. N of No. 1, 250 ft. to W line of SE of SW of Sur. No. 44.. Spudded in.
San Diego Oil Corp.'s No. 2 O. Bennett, 330 ft. to S line, 330 ft. to W line of NE of SE of Sur. No. 44 ..... T.D. 2,301 ft.; 30 bbls. hr.
San Diego Oil Corp.'s No. 3 L. Bennett, 330 ft. from N and W lines of SE SW of Sur. No. 44 ..... T.D. 2,317 ft.; 20 bbls. hr.
San Diego Oil Corp.'s No. 4 E. Riley, 230 ft. from N line, 550 ft. from W line of NW NW of Sur. No. 46.. Rigging up.
Seacord & Putnam's No. 1 Wendt, 150 ft. from S and E lines of NE NE of Sur. No. 44 ..... Rigging up.
The Texas Co.'s No. 1 M. B. Johnson, 330 ft. from S and E lines of N half SW of Sur. 42 ..... Location.
The Texas Co.'s No. 1 C. W. Freer, 150 ft. from S and E lines of SE NE, Sur. No. 45 ..... **Location.**
Whisenant, Trenchard and French Oil Co.'s No. 3 Hahl, 620 ft. from S line, 250 ft. from E line of SW of SW of Sur. No. 44 ..... T.D. 2,303 ft.; set csg.

SOUTH GOVERNMENT WELLS POOL—DUVAL COUNTY

Humble Oil & Ref. Co.'s No. 7 Paul White, 1,320 ft. from W line, 3,630 ft. from S line of Sur. No. 58 .... T.D. 1,977 ft.; drlg.

COLE POOL—DUVAL COUNTY

Cole Petroleum Co.'s No. 78 Benavides, 108 ft. from SE line, 182 ft. from SW line of Blk. 8, Sur. 19 ..... Rigging up.
O. W. Killam's No. 23 Bruni, 50 ft. from NW and SW lines of Blk. 34, Sec. 8 of Adams Sub. of Bruni lands in the Arispe Grant Sur. ..... T.D. 1,302 ft.; drlg.

S.R.C. POOL—DUVAL COUNTY

S.R.C. Oil Co. and Magnolia Pet. Co.'s No. 8 Duval County Ranch Co., 500 ft. N and 200 ft. W of No. 7.. T.D. 1,805 abnd. drlg.

SARNOSA POOL—DUVAL COUNTY

Edwin M. Jones' No. 1 J. F. Williams, 2,156 ft. from NE line, 150 ft. from NW line of Sur. No. 131 ..... T.D. 2,502 ft.; abnd. salt water.
The Texas Co.'s No. 1 R. L. Brown, 635 ft. from SE and SW lines of N quarter of Sur. No. 574 ..... T.D. 1,150 ft.; drlg.
John F. Camp's No. 2 Weil, 1,200 ft. N, 18 deg. W of No. 1 Weil in Sur. No. 570 ..... T.D. 2,320 ft.; drlg.
Smith & Cappe' No. 4 Duval County Ranch Co., Sur. 576.. T.D. 2,340 ft.; set csg., waiting on cement.
Sun Oil Co.'s No. 2 Cuellar (Cano), 150 ft. from SW and SE lines of E¼ of Sur. No. 576..... Rigged up.
Thomas & Tarver, Inc.'s No. 2 Duval County Ranch Co., 660 ft. NW of No. 1 ..... Rigging up.

SAL-MAR FIELD—GUADALUPE COUNTY

Sal-Mar Oil & Gas Co.'s No. 1 Hempel, 1,600 ft. from S line, 150 ft. from E line of tract in G. W. Williams Sur. ..... T.D. 2,023 ft.; dry in chalk.
George E. Smith's No. 1 Behring, 1,250 ft. from E line, 150 ft. from N line of G. W. Williams Sur. .... T.D. 2,362 ft.; plugging back.
A. W. Wormser's No. 1 Harris, 150 ft. from N line of tract and 150 ft. E of creek in Green Dewitt Sur..... Derrick.

HORD'S CREEK—GOLIAD COUNTY

Slick-Seeligson, Inc.'s No. 1 Kaufman, 660 ft. from SE line, 330 ft. from SW line of 4,265-ac. tract ..... Spudded in.

SLICK POOL—GOLIAD COUNTY

Slick-Seeligson's No. 2 Poetter, 330 ft. to SE and SW lines, 1,200 ft. SW of No. 1, Obid Marshall Sur. ..... Location.

SANDIA POOL—JIM WELLS COUNTY

Hughes and Long's No. 1 Wade, center of Blk 2 of Wade Ranch Sub. ..... Derrick.
Larcro Gas & Pet. Co.'s No. 3 Wade, 2,000 ft. S, 33 deg. W of No. 2 Wade, thence 1,970 ft. N, 57 deg. W ..... Material on ground.

JACOB POOL—McMULLEN COUNTY

Jacob, Buzzini & Pickett's No. 6-A Jacob, 1,320 ft. S, 15° W of No. 3-A ..... T.D. 957 ft.; reset csg., well flowing oil.
Longhorn Oil Co. and American Gas Co.'s No. 1 Lark, 2,790 ft. from N line, 1,150 ft. from W line of Lark tract, E.W.B. Scrugham Sur. ..... T.D. 1,007 ft.; bailing.

WENTZ POOL—McMULLEN COUNTY

V. G. Schimmel's No. 2 Two Rivers Ranch Co., 100 ft. E of No. 1 ..... T.D. 400 ft.; S.D.

ADAMS FIELD—MEDINA COUNTY

Yantis Oil Co.'s No. 1-A Adams, 50 ft. from No. 1 ..... T.D. 200 ft.; drlg.

SAXET FIELD—NUECES COUNTY

Houston Oil Co.'s No. 1 Walton, 170 ft. from N line, 220 ft. from E line of 500-ac. tract ..... Rigging up.
Houston Oil Co.'s No. 2-A Harrell, 1,112 ft. from N line, 170 ft. from W line of Sec. 28, Sheppard farm lots ..... T.D. 4,409 ft.; 150 bbls. on 3-16-in. choke.
Gulf Coast Oil Co.'s No. 2 Perkins & Gasse, 650 ft. from N line, 990 ft. from E line of Sec. 26 of Shepherd farm lots ..... T.D. 4,887 ft.; cleaning out.
Gulf Coast Oil Co.'s No. 2 Bliss, 660 ft. W of No. 1 Bliss.. T.D. 4,588 ft.; coring.
Gulf Coast Oil Co.'s No. 1 W. L. Dinn, 330 ft. from N and E lines of lease in School Sur. No. 412 ..... T.D. 3,930 ft.; drlg.
McCarthy-Rogers-Nix et al's No. 1 Isencee, 151 ft. from W line, 172 ft. from N line of Blk. 12 of Shepherd farm lots ..... T.D. 4,550 ft.; gas well spraying oil.
Oso Drillers, Inc.'s No. 3 Roark, midway between Nos. 1 and 2 ..... T.D. 4,518 ft.; drlg.
Saxet Oil Co.'s No. 9 Dunn, 180 ft. from N line, 164 ft. from W line of lease, south offset to Oso Drillers' No. 2 Roark ..... Moving in.

LOS OLMOS POOL—STARR COUNTY

V. V. Combs' No. 1 Kelsey Bass, 150 ft. from N and W lines of NE NE, Sec. 6, Porciones 75, 76 and 77 ..... Location.
Frank Doyno's No. 1 Seabury, 450 ft. from S line, 815 ft. from E line of 80-ac. tract in Share 5, of W portion of Porcion 75 ..... T.D. 260 ft.; drlg.
Hooks & Weaver's No. 13 Kelsey Bass, 150 ft. from N line, 400 ft. from E line of NW of NE of Sec. 8, Subd. of Porcions 75, 76, 77 in Jurisdiction Camargo.. T.D. 487 ft.; abnd.
J. P. Moore and C. B. Van Matre's No. 1 Seabury et al, 150 ft. from E line, 750 ft. from S line of Share 5, Subd. of W part of Porcion 75 ..... T.D. 50 ft.; drlg.
Munday Bros.' No. 1 Seabury, 840 ft. from E line, 4,550 ft. from S line of Share 5, Subd. of W two-thirds of Porcion 75, Jurisdiction of Camargo ..... Rigging up.
Tarver & Nance, Inc.'s No. 6 Kelsey Bass, 750 ft. from W line, 150 ft. from S line of SW SE of Sur. 7, Porcions 75, 76, 77 of Camargo Sur. ..... T.D. 250 ft.; drlg.

RIO GRANDE CITY POOL—STARR COUNTY

Allison & Doyle's No. 1 Salines, 150 ft. to N and E lines of Blk. 2, Share 15-B, Porcions 80 and 81, Camargo.. Location.
Hoffman & Flowers' No. 1 Goodrich, 160 ft. from N line, 450 ft. from W line of Blk. 6, Tract 5, Partition of Porcions No. 80 and 81 ..... T.D. 1,490 ft.; abnd.
Mundy and others' No. 1 Salines, 190 ft. to S and W lines of Blk. 12, Share C-38, Porcions 80 and 81, Camargo ..... Location.
Jack Myers' No. 2 Doyno, 500 ft. from S line, 850 ft. from W line of Blk. 4, Share 77-2, Subd. of Porciones 80 and 81, Jurisdiction of Camargo ..... T.D. 1,880 ft.; abnd., hole lost.
Meyers & McCaghren's No. 2-A Frank Doyno, 500 ft. to S line, 768 ft. to W line of Blk. 4, Share A-77, Porcions 80 and 81 ..... Rigging up.
S. S. Smith's No. 1 O'Meara in Share 76 in W half of Porcion 79, Jurisdiction Camargo ..... T.D. 1,650 ft.; no report.

LAUREL POOL—WEBB COUNTY

Montex Oil Co.'s No. 1 M. Vela, 479 ft. from N line, 490 ft. from W line of Blk. 4, Sur. No. 267 ..... Derrick.
South Texas Oil Co. (Rosenberg) No. 8 Laurel, 150 ft. from S line, 450 ft. from E line of Blk. 10, Sur. 271.. T.D. 2,247 ft.; comp.

WEST COLE POOL—WEBB COUNTY

French Oil Corp.'s No. 1 S. Benavides, 2,017 ft. from E line, 800 ft. from N line of Sur. No. 696 ..... T.D. 2,405 ft.; abnd.

ESCOBAS POOL—ZAPATA COUNTY

S.R.C. Oil Co.'s No. 13-B Cuellar in Blk. 12, Sur. 64 ..... T.D. 975 ft.; drlg.
The Texas Co.'s No. 13 Measles, 2,132 ft. from SE line, 18,284 ft. from SW line of Cerrito Blanco grant ..... Location.

CHARCO REDONDO POOL—ZAPATA COUNTY

L. G. Smith's No. 1 J. M. Martinez, 350 ft. from NE and SE lines of Blk. 18, Share B, Dunke's Subd. of Charco Redondo grant ..... Location.
Windsor Oil Co.'s No. 1 Martinez, in NE of Blk. 15, of W. R. Duke Subd., Charco Redondo grant ..... T.D. 1,100 ft.; no report.

MARTINEZ POOL—ZAPATA COUNTY

H. Muckelroy, Jr.'s No. 1 A. Trevino, 150 ft. from S and E lines of Blk. 10, Sur. No. 411 ..... T.D. 1,300 ft.; drlg.

Wildcat Operations in Louisiana-Arkansas

(Continued from Page 82)

CALDWELL PARISH

Carter Bell's No. 1 Taylor, 150 ft. S, 150 ft. E, NW cor. NE SE, Sec. 17-14-4 ..... S.D. 3,712 ft.

CLAIBORNE PARISH

Leue Oil Co.'s No. 1 Kinder, Sec. 2-21-7 ..... Rigging up.
Robertson & Aurand's No. 1 Smith, 200 ft. S and E, NW cor. SE NE, Sec. 8-21-7..... Rigging up.

CONCORDIA PARISH

M. M. Stoker et al's No. 1 Gillespie, Sec. 56-8-10..... Drlg. 3,600 ft.

DE SOTO PARISH

Coker et al's No. 1 Boone, 200 ft. N and W, SE cor. SW NW, Sec. 12-10-11 ..... S.D. 60 ft.
Donley & Chastain's No. 1 H. Smith, 325 ft. W, 600 ft. N. SE cor., Sec. 31-14-15 ..... Laying wtr. line; T.D. 3,470 ft.
Honeycut O. & G. Co.'s No. 1 Porter, 423 ft. S, 414 ft. W, NE cor. NW NE, Sec. 26-12-13..... Rigging up.
S. A. Guy's No. 1 Dowling, 469 ft. E, 382 ft. S, NW cor. NE, Sec. 31-14-14 ..... S.D. for wtr. 3,068 ft.
E. T. Oakes' No. 1 R. H. Bryant et al, 200 ft. N and W, SE cor. NE NW, Sec. 30-13-15..... S.D. 4,110 ft.
DeSoto Dev. Co.'s No. 1 Nickey, Sec. 7-13-12..... Partly rigged up and S.D.
G. C. Smith et al's No. 1 Wollums, 320 ft. N and W, SE cor. Sec. 30-12-12 ..... S.D. for fuel 1,255 ft.
E. J. Stanberry's No. 1 Naborton O. & G. Co., Sec. 32-13-11 ..... S.D. for wtr. 800 ft.
Walters-Nicholson, tr.'s No. 1 Jim Guy, Sec. 3-11-13....C.O. tubing 2,767 ft.
Warren & Craig's No. 1 J. A. Wagner, 150 ft. S and W, from C, Sec. 5-12-14..... Derrick.
Jack Whitson's No. 1 Sanders, 330 ft. N and E, SW cor., Sec. 19-11-13 ..... S.D. for wtr. 960 ft.

GRANT PARISH

O. Robichaux's No. 1 T. M. Bradford, 1,870 ft. E, 314 ft. S, NW cor., Sec. 16-9n-1e ..... Derrick.

JACKSON PARISH

Hodge-Hunt Lbr. Co.'s No. 4 fee, SW SW, Sec. 19-15-3w. Drlg. 1,760 ft.

MOREHOUSE PARISH

Feazel & Kalil's No. 1 Davenport, Sec. 28-21-4e. Drlg. 2,380 ft.
H. W. Snowden's No. 1 Meyers, 330 ft. S and E, SW cor. NE NE, Sec. 15-22-7e. Derrick.

NATCHITOCHES PARISH

W. M. Coates' No. 1 Rose Olive, Sec. 10-9-10, 660 ft. S and E from cen. of Sec. S.D. 2,010 ft.
Dr. H. S. Gerson's No. 1 Smith, Sec. 11-10-8, 2,000 ft. N, NE cor. of irregular Sec. 10, in Sec. 11. T.A. 1,875 ft.
Dr. H. S. Gerson's No. 3 Smith, approximately 1,000 ft. N of NE cor. of irregular Section 10, Sec. 11-10n-8w. Fishing 300 ft.
J. B. Oil Co.'s No. 1 Hankins et al, Sec. 67-10-7. Rigging up.
R. A. Keaton's No. 1 Bastrop State Bank, 200 ft. N and W, SE cor. NE NW, Sec. 17-10-6. Location.
R. A. Keaton's No. 1 Stephens, Sec. 25-10-6, 320 ft. N and W, SE cor. NW NW. S.D. 1,700 ft.
Natchitoches Pet. Co.'s No. 1 Edenbarn, 2,240 ft. W, 1,320 ft. S, NE cor., Sec. 4-11-6w. Drlg. 1,430 ft.
H. W. Perritt's No. 1 Cook, 165 ft. E, 165 ft. N, SW cor. NE SW, Sec. 3-8-9. S.D. 2,992 ft.
Sabine Bayou Dev. Co.'s No. 1,130 Caw, 330 ft. N and E, SW cor. SE, Sec. 9-12-5. S.D. 1,844 ft.
Texana Oil Co.'s No. 1 Clark-Morris Lbr. Co., 878 ft. N, 660 ft. E. C, Sec. 23-8-6. S.D. 3,450 ft.

OUACHITA PARISH

Monroe Oil & Royalties Co.'s No. 1 Thieler, 150 ft. N and E, SW cor. SE NW, Sec. 34-18-2e. S.D. 1,950 ft.
Wilson & Mitchell's No. 1 Williams, Sec. 5-16-1e, 330 ft. E, 240 ft. S, NW cor. SW SE. S.D. 3,480 ft.

RED RIVER PARISH

C. F. Davis' No. 1 Pierson, 500 ft. S, 317 ft. E, NW cor. SW NW, Sec. 12-14-11. Location.
Edward & Clay's No. 1 Delta Pecan Co., 1,600 ft. N, 450 ft. E, SW cor., Sec. 37-13-11. S.D. for fuel 400 ft.
Lawrence Decker, tr.'s No. 1 Madden, 1,650 ft. S and W, NE cor., Sec. 21-14-10. S.D. 2,700 ft.

RICHLAND PARISH

National Gas Co.'s No. 1 Singletary, 1,980 ft. N, 660 ft. W, SE cor., Sec. 20-18n-7e. S.D. 2,515 ft.

SABINE PARISH

Adams & Roberson's No. 1 Peterson, 406 ft. N, 200 ft. W, SE cor. NE NE, Sec. 35-8-13. S.D. 100 ft.
J. M. Bridges' No. 1 Moore, 660 ft. E, 330 ft. N, SW cor. NE NW, Sec. 5-9-12. Set 6-in. 3,228 ft.
Bridwell O. & G. Co.'s No. 1 La. Long Leaf, 330 ft. N and W, SE cor. NE NW, Sec. 31-8-10. Drlg. 2,666 ft.
R. E. Brooke's No. 1 A. Gray, 330 ft. N and W, SE cor. SW NE, Sec. 35-8-13. Location.
John R. Bunn's No. 1 Sabine Lbr. Co., 295 ft. S, 336 ft. W, NE cor. SW NE, Sec. 9-7-13. Testing 2,422 ft.
Byers et al's No. 1 Bishop, SW cor. SW NE, Sec. 16-7-13. S.D. 41 ft.
Clopton et al's No. 1 Garcia, 330 ft. N and W, SE cor. SE NW Sec. 4-7-13. Derrick.
Cloud & Bolin's No. 1 Bowman-Hicks, SE cor. NE NE, Sec. 26-9-13. Rigging up.
W. M. Coates' No. 1 Gray, 330 ft. N and W, SE cor. SW, Sec. 3-7-13. Location.
W. M. Coates' No. 2 Gray, 330 ft. S and W, NE cor. SE SW, Sec. 3-7-13. Location.
Coates Pet. Co.'s No. 2 Stille, 330 ft. N and E, SW cor. SE SW, Sec. 35-8-11. W.O.S.R. 2,465 ft.
Coates Pet. Co.'s No. 3 Stille, 330 ft. N and E, SW cor., Sec. 35-8-13. Location.
Mark Curtis et al's No. 1 Sabine Lbr. Co., 330 ft. N and W, SE cor. NE SE, Sec. 35-8-13. S.D. 2,045 ft.
B. Q. Daniels' No. 1 Armstrong, SE cor. SE NE, Sec. 21-8-10. Derrick.
Mrs. Dabney's No. 1 Hill, 265 ft. N, 235 ft. W, SE cor. NE NE, Sec. 5-7-11. Location.
Mrs. Dabney's No. 2 Hill, 330 ft. S, 235 ft. W, NE cor., Sec. 5-7-11. Location.
R. E. Davidson's No. 1 Davis, 600 ft. S, 125 ft. E, NW cor., Sec. 23-7-11. S.D. 2,823 ft.
William DeSota's No. 1 Mooney, 350 ft. S, 395 ft. E, NW cor., Sec. 35-8-13. Derrick.
R. A. Ferrell's No. 1 Haley, Sec. 4-7-13, 300 ft. S and E, NW cor. NW SW. Dry and abd. 2,511 ft.
Flinchbaugh & Myers' No. 1 Aaron, 250 ft. S and E, NW cor., Sec. 32-9-13. Drlg. 1,950 ft.
R. L. Gay, tr.'s No. 12 Bowman-Hicks, 330 ft. S, 390 ft. W, NE cor. SW SW, Sec. 14-7-14. Drlg. 1,902 ft.
R. L. Gay, tr.'s No. 1-A Long Bell Lbr. Co., 450 ft. S, 300 ft. W, NE cor. NW NW, Sec. 10-8-13. Coring shale and lime 6,357 ft.
Gibson & Johnson, Inc.'s No. 1 Frost Lbr., 330 ft. S and E, from center Sec. 19-9-13. Drlg. plug 1,543 ft; T.D. 1,624 ft.
Gibson & Johnson, Inc.'s No. 2 Frost Lbr., 330 ft. S and W, NE cor. NW NE, Sec. 15-9-13. Derrick.
W. N. Hankins' No. 1 Tilley, 300 ft. E, 30 ft. S, NW cor. SE SE, Sec. 30-8-12. S.D. 2,162 ft.
Helis et al's No. 1 Sabine State Bank, 350 ft. N and W, SE cor. SW SW, Sec. 28-8-11. S.D. 41 ft.
Ab Jones' No. 1 Garcia, 200 ft. S and W, NE cor. NW SE, Sec. 4-7-13. Set 6-in. 2,070 ft.
G. E. Jordan's No. 1 Dew, 330 ft. N, 340 ft. E, SW cor. SW SE, Sec. 34-8-11. S.D. for wtr. 950 ft.
S. A. Lane et al's No. 1 DeKeyser, 233 ft. E, 330 ft. S, NW cor. NE, Sec. 28-7-11. Dry and abd. 2,930 ft.
Geo. LeGrand's No. 1 McGough, Sec. 3-8-10. S.D. for csg. 2,200 ft.
H. C. Maulding's No. 1 Moores, 330 ft. S and W, NE cor. SE NE Sec. 16-7-13. Drlg. 1,670 ft.
Paul L. Miller, tr.'s No. 1 Chadick, 550 ft. S, 178 ft. E, NW cor. NE SW, Sec. 32-8-10. Swabbing 2,589 ft.
E. F. Neely's No. 1 Rains, 660 ft. N, 100 ft. W, SE cor., SW NW, Sec. 14-7-11. W.O.S.R. 2,541 ft.
W. M. Neely's No. 1 Buvens, 350 ft. S, 100 ft. E, NW cor. NE, Sec. 21-7-11. S.D. 250 ft.
C. D. Neff, tr.'s No. 1 Snell, Sec. 9-7-11, 350 ft. N, 660 ft. W, SE cor. Sec. W.O.S.R. 2,509 ft.
H. W. Perritt's No. 3 Brown Lbr. Co., 519 ft. S, 455 ft. W, NE cor. NW NE, Sec. 31-8-10. S.D. 400 ft.
Roy Raines et al's No. 1 Beard, 720 ft. E, 700 ft. N, SW cor. SW SE, Sec. 8-8-1e. Derrick.
Thornton et al's No. 1 S. S. Martines, 355 ft. S, 330 ft. W, NE cor. SE NE, Sec. 4-7-13. S.D. 2,048 ft.
Otis A. Roberts' No. 1 Sabine Lbr. Co., 324 ft. S, 481 ft. W, NE cor. SW NE, Sec. 5-7-13. S.D. 2,500 ft.
Roberts & Sledge's No. 1 La. Long Leaf Lbr. Co., 290 ft. N, 468 ft. E, SW cor. NE SE, Sec. 29-8-10. Location.
Robeate & Sledge's No. 1 Lefkobita, 346 ft. S, 672 ft. E, NW cor. SE NE, Sec. 5-7-13. Derrick.
Robeate & Sledge's No. 2 Sabine Lbr. Co., 803 ft. W, 796 ft. N, SE cor. SE SW, Sec. 5-7-13. W.O.S.R. 2,480 ft.
Robeate & Sledge's No. 3 Sabine Lbr. Co., 413 ft. N, 479 ft. W, SE cor. SE SW, Sec. 33-8-13. Derrick.
Roshko & Labarre's No. 1 Maines, 427 ft. E, 114 ft. N, SW cor. SE NE, Sec. 35-8-11. Location.
Skully & Beach's No. 3 Lafitte, 1,400 ft. S, 133 ft. W, NE cor. NW NW, Sec. 13-7-11. Location abd.
C. W. Smith et al's No. 1 Pattison, 330 ft. S and E, NW cor. SE NW, Sec. 33-10-11. Derrick.
H. R. Smith et al's No. 1 La. Long Leaf Lbr. Co., Sec. 13-7-11, 330 ft. S and W, NE cor. NW SW. Location.
Sneed & Sneed's No. 1 Pearce, 200 ft. N, 215 ft. E, SW cor. NE SW, Sec. 35-8-13. S.D.; W.O. 2,405 ft.
Southland Drlg. Co.'s No. 1 Frost Lbr. Co., 330 ft. N and W, SE cor. NE NE, Sec. 13-9-11. S.D. 1,905 ft.
H. B. Stacey et al's No. 1 Hefkobita, 457 ft. N, 583 ft. E. SW cor. SE, Sec. 34-8-13. Drlg. 2,460 ft.
Supreme Oil Co.'s No. 1 Pruitt, 330 ft. N and E, SW cor. SE SW, Sec. 30-8-11. S.D. 2,226 ft.
B. E. Taylor's No. 1 Gay, 253 ft. S, 476 ft. E, NW cor. SE SW, Sec. 36-8-13. Location.
B. E. Taylor's No. 1 Wooley, 330 ft. N and E, SW cor. SE SW, Sec. 36-8-13. Location.
A. F. Tarver's No. 3 Cutrer, Sec. 12-7-11, 1,120 ft. E, 300 ft. N, SW cor. NW. W.O.S.R. 2,600 ft.
Thornton et al's No. 2 S. S. Martines, 312 ft. E, 295 ft. S, NW cor. SE NE, Sec. 4-7-13. Location.
A. A. Trammell's No. 1 Sepulbedo, 330 ft. N and W, SE cor. NW NE, Sec. 5-7-13. Derrick.
Triangle Drlg. Co.'s No. 1 La.-Long Leaf Lbr. Co., 330 ft. N and W, SE cor. Sec. 11-6-11. Washing to bottom 4,013 ft.
Tuffree et al's No. 1 T. L. Andries, N½ NE SE, Sec. 15-7-11. S.D. 100 ft.
W. M. Ungerman's No. 1 F. Cross, 53 ft. S, 146 ft. W, NE cor. SW SE, Sec. 25-8-11. Moving in rig.

TENSAS PARISH

H. V. Schumacker's No. 1 Currey, 1,320 ft. S, 1,320 ft. E. NW cor., Sec. 39-11-12. S.D. 3,645 ft.

UNION PARISH

E. S. Goens et al's No. 1 Frost Lbr. Co., 330 ft. S and E, NW cor., Sec. 17-22-2e. Location.

VERNON PARISH

Earl Jones' No. 1 Willis, 350 ft. N, 400 ft. E, SW cor. SE SE, Sec. 32-3n-9w. Derrick.
Llano Co-operative Colony's No. 1 fee, NW NE, Sec. 34-3n-9w. Drlg. 2,016 ft.

WEBSTER PARISH

George Pearce et al's No. 1 Ambrose, 200 ft. N and W, SE cor. SW SE, Sec. 22-20-10. Fishing 2,100 ft.

WINN PARISH

P.V.T. Oil Co.'s No. 1 Southern Paper Co., 150 ft. S and W, NE cor. SW, Sec. 28-13-3. Fishing 1,040 ft.

Arkansas

CLAY COUNTY

S. C. Jeffus' No. 1 Underwood, 510 ft. N, 350 ft. W, C, NW SE, Sec. 4-20-3. S.D. 1,253 ft.

CLEBURNE COUNTY

Frank S. Craver et al's No. 2 Doniphan Lbr. Co., 700 ft. N, 200 ft. E, SW cor. SW, Sec. 34-11-9. Drlg. 690 ft.

CLEVELAND COUNTY

Crum & Stillwell's No. 1 E. R. Bell, Sec. 10-10s-13. Rig abd.

COLUMBIA COUNTY

Kendall Oil Co.'s No. 1 Fullenweider, 300 ft. S and E, NW cor. NE NE, Sec. 13-17-22. S.D. 2,175 ft.

DALLAS COUNTY

J. H. James, tr.'s No. 1 Fordyce Lbr. Co., 200 ft. S, 200 ft. E, NW cor. SE, Sec. 11-9-15. Dry and abd. 2,575 ft.

DREW COUNTY

Co-Operative Dev. Co.'s No. 1 Ogles, Sec. 35-15-5, 330 ft. S and E, NW cor. NE NW. Coring 3,274 ft.

FRANKLIN COUNTY

Ozark Natural Gas Co.'s No. 1 Monroe, C NW NE, Sec. 13-8-29. Comp. 3,000,000 ft. gas 2,380 ft.

HOT SPRINGS COUNTY

Star Oil Co.'s No. 1 Cunningham, 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16. S.D. 1,340 ft.

LAFAYETTE COUNTY

Fox & Langford's No. 1 Coleman Bros., 330 ft. S and E, NW cor. SE SE, Sec. 25-16-25. Derrick.
Sam E. Wilson, Jr., No. 1 Smith, 330 ft. N and E, SW cor. NW SE, Sec. 24-19-25. Derrick pattern.

LINCOLN COUNTY

Lawrence Cook, tr.'s No. 1 McGhee Planting Co., 420 ft. S, 200 ft. W, NE cor. NE SW, Sec. 5-8-7. S.D. 3,250 ft.

LITTLE RIVER COUNTY

American Portland Cement Co.'s No. 1 fee, 150 ft. S and E, NW cor. SW NE, Sec. 21-12-32. Derrick.
Harrell et al's No. 1 Taffee, 32 ft. W, 630 ft. E, 330 ft. S, SW cor. W NW, Sec. 25-12s-32w. S.D. 2,968 ft.

MILLER COUNTY

Duluth-Ark. Oil Co.'s No. 1 Stone, SE cor. SW, Sec. 32-14-26. Plugged back to 2,300 ft; T.D. 2,535 ft.
Goodwin et al's No. 1 E. A. McCowand, NW cor. NW SE, Sec. 22-15-28. Rigging up.
Fitzwater et al's No. 1 C. J. Norsen, SW cor. SE SW, Sec. 20-15-27. Set 10-in. 121 ft.
Fitzwater et al's No. 1 Beck, Sec. 33-15-26. Testing 2,954 ft.
Fitzwater et al's No. 2 Beck, 150 ft. N and E, SW cor. SW SE, Sec. 33-15-26. Derrick.
Fitzwater et al's No. 1 Fouke, 150 ft. S and W, NE cor., Sec. 11-17-27. Set 12½-in. 105 ft.
Wm. S. King's No. 1 Beck, 330 ft. S and E, NW cor. NE NW, Sec. 35-15-26. Location.
Chas. B. Lenz's No. 1 Dean, 125 ft. E, 200 ft. S, NW cor. SE Sec. 19-15s-25w. Derrick.
W. E. Noel et al's No. 1 Dickson hrs., 1,980 ft. W, 660 ft. S, NE cor., Sec. 11-20-27. S.D; W.O. 2,800 ft.

OUACHITA COUNTY

Copenhaven et al's No. 2 Berg, C SE SE, Sec. 13-15-17. Abd.; will not pump.
McLean et al's No. 1 L. D. Neely, Sec. 23-15-16, 200 ft. N and W, SE cor. NE SW. S.D. 150 ft.
Chas. Steele et al's No. 1 Anderson, 155 ft. S, 150 ft. E. from center Section 36-12-18. S.D. 525 ft.

PIKE COUNTY

S. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24. S.D.; W.O. 1,030 ft.
S. R. Henderson's No. 1 W. B. East, 200 ft. S, 150 ft. W. NE cor., Sec. 13-9-23. Rigging up on new hole.

PRAIRIE COUNTY

Powell Creek O. & G. Co.'s No. 1 Kloss, NE SW, Sec. 8-4n-8w. Partly rigged up and S.D.

SCOTT COUNTY

Waldron O. & G. Co.'s No. 1 White, NE cor. SW NW, Sec. 17-3n-29. Abd. 1,860 ft.

SEVIER COUNTY

Allstate Oil Co.'s No. 1 Grimble, Sec. 34-8-22, S½ SW. Abd. 950 ft.

ST. FRANCIS COUNTY

S. R. Henderson's No. 1 Britton, Sec. 1-4-1e, 1,000 ft. S and E NW cor. NE NW. Drlg. chalk 3,310 ft.

UNION COUNTY

Cox et al's No. 1 Goodwin, 360 ft. S, 180 ft. W, NE cor. SW SW, Sec. 3-16-16. S.D. 140 ft.
J. H. Helms' No. 1 C. H. Murphy, NE cor. NW NE, Sec. 31-16-14. Fishing 2,969 ft.
Wilson & Chapman's No. 1 King, Sec. 3-18-13, 330 ft. N and E, SW cor. NE NE. Derrick.
Wilson & Chapman's No. 1-A D. Norman, 330 ft. S and E, NW cor. N½ NE SE, Sec. 3-18-13. S.D. 1,678 ft.

WASHINGTON COUNTY

(Cable tools)

B. Chase and Ed Rogers' No. 1 Cunningham, 125 ft. S, 300 ft. W, NE cor. SW NE, Sec. 14-15-32. S.D. 1,750 ft.

East Texas

BOWIE COUNTY

Hogan & Elliott's No. 1 Smith, 5,600 ft. S, 2,500 ft. W, NE cor. Chas. Lewis Sur. S.D. 4,505 ft.
Sanford et al's No. 1 W. W. Whybark, 200 ft. S, 200 ft. W, SW cor. J. H. Dyer Sur. S.D. 1,792 ft.

CASS COUNTY

Davis & Pigg's No. 1 Roy Bryan, SW cor. Roy Bryan 33-ac. tr., Albert H. Lattimer Sur. ....S.D. 2,860 ft.
C. E. Murdock's No. 1 First National Bank, Evans Watson Sur. ....S.D. 4,390 ft.
John C. Rogers' No. 1 L. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 34 ac. in K. E. Welborn Sur. ....S.D. 2,280 ft.
John C. Rogers et al's No. 1 W. Q. Henderson, 3,100 ft. S, 3,100 ft. E, NW cor., Wm. Davis Sur. ....S.D. 960 ft.

HARRISON COUNTY

M. E. Nash et al's No. 1 Henderson, G. L. Bledsoe Sur....S.D. 85 ft.
Ryan Cons. Pet. Corp.'s No. 1 J. M. Fuhr, 1,300 ft. N of NW cor. T. J. Copelin Sur., 1,675 ft. SW at right angles to NW SE line of O'Neal Sur. ....Drlg. 3,780 ft.
Triangle Drlg. Co.'s No. 1 Platt, 1,125 ft. W, 1,995 ft. N, SE cor. F. C. Barker Sur. ....Location.

MARION COUNTY

Baunoch Dev. Co.'s No. 1 Miller, 725 ft. N, 1,470 ft. E, SW cor. H. Fulgram Sur. (was Gist, Claunch & Dodson) ....Reaming 4,820 ft.
Geo. Hindeman et al's No. 1 F. V. Lindsey, 2,500 ft. S, most northerly N line, 3,555 ft. E most easterly W line, Alexander Albright Sur. ....S.D. 2,380 ft.
Purcell et al's No. 1 Coker, M. Reed Sur. ....S.D. 1,957 ft.
Starling & Preston's No. 1 Henderson, R. Bennington Sur. H. R. S. ....Rigging up.

PANOLA COUNTY

Root-Skinner's No. 1 Daniel, 600 ft. N and W lines, Mrs. Gerrell 100-ac. tr., SW cor. Isabel Hanks Sur....S.D. for D.S. 740 ft.
J. L. Nelson et al's No. 1 J. Williams, 300 ft. S, 700 ft. W, NE cor. Williams' 67-ac. tr. in James Hanks Sur. ....S.D. 3,055 ft.

SHELBY COUNTY

E. H. Francis' No. 1 John Mims, Mary Smith Sur. ....Coring 2,822 ft.
General Minerals Co.'s No. 2 Pickering Lbr. Co., 600 ft. N, 400 ft. E, SW cor. D. S. Height Sur. ....Drlg. 2,555 ft.
Oil News' No. 1 Pickering, C. H. Patterson Sur. ....Drlg. 2,110 ft. (O.W.D.D.).
Henry Maulding's No. 1 Frost Lbr. Co., NE cor. Frost Lbr. Co.'s 20-ac. tr., A. D. Fountain Sur. ....Rigged up and S.D.
Prairie Creek Crude Co.'s No. 1 Ellington, 150 ft. N and 200 ft. W from SE cor. 42-a. tr. of J. Burleson Sur.. Coring 2,712 ft.
Ridgeway et al's No. 1 Polley, Dominguez Gonzales Sur., 3,180 ft. E of SW cor., 160 ft. N at right angles of Polley 457-ac. tr. ....Drlg. 2,813 ft.
Sedberry et al's No. 1 Pickering Lbr. Co., 600 ft. N, 400 ft. E, SW cor. Jane Stoddard Sur. ....S.D. 2,375 ft.
Western World's No. 1 Foster, Billingsby-Jeremiah Bowlin Sur. ....S.D. 2,940 ft.
Wray & Dunbar's No. 1 C. A. Hayden, 600 ft. N and W SE cor. 152-ac. tr. in D. T. F. Yordt Sur. ....S.D. for wtr. 2,280 ft.

Louisiana-Arkansas Proven Areas

North Louisiana

CADDO—RODESSA AREA

Company, well, farm name, section and block— Remarks:
Ark.-La. P. L. Co.'s No. 1 F. E. Gloyd, 660 ft. E, 100 ft. S, NW cor. NW NE, Sec. 34-23-16....Set 13⅜-in. 210 ft.

CADDO—BETHANY AREA

Calatex O. & G. Co.'s No. 1 Mrs. E. Augurs, 3,567 ft. N, 2,600 ft. E, SW cor., Sec. 19-16-16....Derrick.
Calatex O. & G. Co.'s No. 1 J. M. Agure, 2,000 ft. N, 800 ft. E, SW cor., Sec. 9-16-16....Set 10-in. 240 ft; drlg. 400 ft.

CADDO PARISH

D. C. R. Oil Co.'s No. 1 Caddo School Board, 2,125 ft. S, 1,500 ft. W, NE cor., Sec. 16-19-14....Comp. flowing 75 bbls. 2,449 ft.
Louana Oil & Gas Co.'s No. 1 Cushman, 1,320 ft. N, 600 ft. E, SW cor., Sec. 33-19-16 ....T.A. 2,800 ft.

CLAIBORNE PARISH

Triangle Drlg. Co.'s No. 1 Brown, 1,542 ft. N, 1,900 ft. W, SE cor. NE, Sec. 1-19-6 ....Bailing 4,490 ft.

RICHLAND PARISH

Pelican Nat. Gas Co.'s No. 1 Noe, C W½ NE, Sec. 14-17-5e ....Comp. 15,000,000 ft. gas 2,353 ft.

SABINE PARISH—ZWOLLE

Abbott & Rankin's No. 1 Nulton, 330 ft. S and E, NW cor. SE NE, Sec. 2-7-13 ....W.O.S.R. 2,397 ft.
Jule Alford's No. 1 Stoker, 212 ft. N and W, SE cor. NE SW, Sec. 10-7-11....10-in. at 40 ft; S.D. 600 ft.
J. O. Andree's No. 1 Sabine Lbr. Co., 230 ft. S and E, NW cor. SW NW, Sec. 11-7-13....Tested dry; S.D. 2,569 ft.
J. H. Askew's No. 2 Henderson, 420 ft. S, 190 ft. W, NE cor. SW SE, Sec. 31-8-10....Derrick.
J. H. Askew's No. 2-E McNeely 65 ft. S, 100 ft. W, NE cor. SE NE, Sec. 14-7-11....Derrick.
J. H. Askew's No. 1-E McNeely, 220 ft. S, 260 ft. W, NE cor. SE NE, Sec. 14-7-11 ....T.A. 2,632 ft.
J. H. Askew's Ne. 1 Lyons, 330 ft. W, 252 ft. N, SE cor. SE NE, Sec. 31-8-10....Set 6-in. 2,445 ft.
Baird Bros.' No. 3 Martinez, 1,012 ft. S, 907 ft. E, NW cor. NW SW, Sec. 2-7-13....Rigging up.
Cameron Oil Co.'s No. 1 G. Martinez, 845 ft. E, 540 ft. N, SW cor., Sec. 2-7-13 ....Rigging up.
Capitol-Crescent Oil Co.'s No. 1 Sabine State Bank, 990 ft. E, 838 ft. N, SW cor. NW SW, Sec. 2-7-13....Derrick.
Coates Pet. Co.'s No. 4 S. S. Martinez, 97 ft. S, 215 ft. W, NE cor. NE SE, Sec. 3-7-13....Tested dry; S.D. 2,519 ft.
Continental Drlg. Co.'s No. 1 Leone est., 70 ft. N, 200 ft. W, SE cor., Sec. 31-8-12....Derrick.
Dengall O. & G. Co.'s No. 1-F Nulton, 330 ft. S and E, NW cor. SW NW, Sec. 2-7-13....W.O.S.R. 2,501 ft.
Dengall O. & G. Co.'s No. 2-G Nulton, 330 ft. N and E, SW cor. NE NE, Sec. 3-7-13 ....S.D; W.O. 2,475 ft.
Edwards & Hubier's No. 1 G. Martinez, 510 ft. S, 280 ft. E, NW cor. SW SW, Sec. 2-7-13....Derrick.
J. E. Grandstaff's No. 1 Johnson, 8½ SW SW, Sec. 2-7-11 W.O.S.R. 2,592 ft.
J. J. Hall's No. 4 Jacoba, 175 ft. W, 300 ft. N, SE cor. Sec. 1-7-11 ....S.D. 2,710 ft.
D. D. Holcomb's No. 2 Quayhaglew, 149 ft. N, 200 ft. E SW cor. SE SE, Sec. 11-7-11 ....W.O.S.R. 2,606 ft.
Imperial Producers Co.'s No. 1 Leone Est., 1,324 ft. S, 660 ft. E, NW cor., Sec. 32-8-12 ....Location.
H. M. Jones' No. 1 Raines, 300 ft. S, 150 ft. W, NE cor. NW NW, Sec. 14-7-11 ....S.D. 2,410 ft.
E. T. Kilgore's No. 1 Pate, 330 ft. N and W, SE cor. NE NE, Sec. 32-8-11....Tested dry 2,704 ft.
W. F. Lacey's No. 4 McNeely, 200 ft. N and W, SE cor. NE NE, Sec. 14-7-11....Comp. flowing 1,500 bbls. 2,606 ft.
Lanier et al's No. 2 Steinhorst, 150 ft. S and W, NE cor. SE NW, Sec. 3-7-13....W.O.S.R. 2,450 ft.
Lee & Burnett's No. 1 Travis, 510 ft. S, 150 ft. E, NW cor. NE NW, Sec. 13-7-11....Rigging up.
Lion Oil Ref. Co.'s No. 2 LaRoux, 384 ft. S and W, NE cor. SW SE, Sec. 3-7-13 ....Location.
Lyons & Neely's No. 3 Clanon, SE cor. SE NW, Sec. 14-7-11....10-in. at 42 ft; drlg. 845 ft.
Loring Oil Co.'s No. 21 Bowman-Hicks, 450 ft. S, 275 ft. E, NW cor. SW NW, Sec. 16-7-12....Testing 2,514 ft.
Magnolia Pet. Co.'s No. 2 Williams, 240 ft. S, 261 ft. E, NW cor. NW NE, Sec. 6-7-10....Swabbing 2,653 ft.
H. D. McDonald's No. 1 T. L. Andrin, 180 ft. E, 150 ft. N, SW cor. NW SE, Sec. 15-7-11 ....Derrick.
Frank Melat's No. 1 Davis, 175 ft. W, 225 ft. S, NE cor., Sec. 2-7-11 ....S.D.; W.O. 2,552 ft.
Ben Merritt, trustee's No. 1 Chadick, SW cor. SW NE, Sec. 31-8-10 ....S.D. 38 ft.
E. F. Neely's No. 2 Ponder, SW cor. SE SE, Sec. 2-7-11..Set 6-in. 2,371 ft.
Pelican Nat. Gas Co.'s No. 16 La. Long Leaf Lbr. Co., 86 ft. S, 544 ft. W, NE cor. NW NE, Sec. 10-7-11....Set 6-in. 2,400 ft.
Pelican Nat. Gas Co.'s No. 9 Sabine Lbr. Co., 200 ft. N and E, SW cor. NE SW, Sec. 3-7-13....Drlg. 1,605 ft.
T. L. Phillips et al's No. 1 Haley, 330 ft. S and E, NW cor. NW SE, Sec. 6-7-12 ....Derrick.
H. C. Pitts et al's No. 1 Trammell, 1,037 ft. S, 150 ft. E, NW cor. NE NE, Sec. 5-7-11....Location.
Ritchie Prod. Co.'s No. 1 Byrd, 503 ft. N, 399 ft. W, SE cor. NE NW, Sec. 1-7-11....Set 6-in. 2,418 ft.
O. J. Rowe's No. 2 Williams, 170 ft. N, 200 ft. E, SW cor. SW NW, Sec. 13-7-11....Set 10-in. 20 ft; set 4½-in. 2,527 ft.
Sabine Prod. Co.'s No. 3 Pearce, Sec. 10-7-11, 330 ft. S and E, NW cor. SE NW....S.D.; W.O. 2,699 ft.
Sabine Prod. Co.'s No. 3 Sabine Lbr. Co., SW cor. NW SE, Sec. 3-7-13 ....Derrick.
Scully & Beach's No. 3 Lafitte, 1,030 ft. S, 134 ft. E, NW cor., Sec. 13-7-11....Derrick pattern.
Skidmore Oil Co.'s No. 1 G. Martinez, 396 ft. E, 330 ft. S, NW cor. SE SE, Sec. 3-7-13 ....Dry and abd. 2,463 ft.
Ben F. Smith's No. 2 Turner, 250 ft. N, 450 ft. E, SW cor. NW NW, Sec. 4-7-11 ....Drlg. 2,375 ft.
F. E. Stancil's No. 1 Pouder, 273 ft. S, 397 ft. E, NW cor. NE SE, Sec. 10-7-11 ....S.D. 2,593 ft.
State Prod. Co.'s No. 1 Keazele, 150 ft. N and W, SE cor. NW SW, Sec. 3-7-13 ....S.D.; W.O. 2,427 ft.
State Prod. Co.'s No. 1 Lites, 150 ft. S and W, NE cor. SE SW, Sec. 28-8-11 ....Derrick.
State Prod. Co.'s No. 1 Sabine Lbr. Co., 365 ft. N, 100 ft. W SE cor. NW SW Sec. 3-7-13 ....S.D. 2,427 ft.
H. H. Stout et al's No. 1 Byrd, 150 ft. N and E, SW cor. NW NW, Sec. 1-7-11....S.D. 1,800 ft.
The Coming Oil Co.'s No. 1 Williams, 130 ft. N, 50 ft. E, SW cor. SE SW, Sec. 31-8-10....Set 10-in. 40 ft.
The Texas Co.'s No. 4 Stille, 530 ft. E, 330 ft. N, SW cor., Sec. 33-8-11....Dry and abd. 2,650 ft.
W. C. Turnbow's No. 4 Williams, 210 ft. S, 613 ft. E, NW cor. SW NW, Sec. 13-7-11....Dry and abd. 2,632 ft.
C. H. Tuttle's No. 3 Byrd, 700 ft. E, 510 ft. S, NW cor., Sec. 7-7-10....W.O.S.R. 2,727 ft.
J. P. White's No. 1 Nulton, 330 ft. N and E, SW cor. NE NW, Sec. 1-7-13 ....S.D. 2,455 ft.
George Woulf's No. 1 Nulton, 330 ft. S, 380 ft. E, NW cor. SW NE, Sec. 3-7-13 ....W.O.S.R. 2,430 ft.

UNION PARISH

Southern Carbon Co.'s No. 61 fee, 2,210 ft. N, 660 ft. E, SW cor. SE, Sec. 17-20-4e ....Set 6-in. 2,099 ft.
G. H. McHenry, tr.'s No. 1 Potts, 2,044 ft. N, 394 ft. W, SE cor. NE, Sec. 15-21-3e....Location.
Southern Carbon Co.'s No. 62 fee, 1,920 ft. S and W, NE cor. NW, Sec. 30-20-4e....Location.

Arkansas

UNION COUNTY—URBANA

Marine Oil Co.'s No. 1 Winn est., 330 ft. S and E, NE cor. S½ NW, Sec. 11-18-13....T.A. 3,586 ft.
Marine Oil Co.'s No. 2-E Thompson, 330 ft. N, 330 ft. E, SW cor. NE NE, Sec. 10-18-13....Location.
Wilson & Chapman's No. 1-B Hadley, Sec. 3-18-13, 330 ft. S and W, NE cor. SE NW....T.A. 3,545 ft.
Wilson & Chapman's No. 2 Emily King, Sec. 3-18-13, 150 ft. S, 150 ft. E, NW cor. NE NE....S.D. 1,730 ft.

East Texas

PANOLA COUNTY

Daisy O. & G. Co.'s No. 1 Rucks, John Palmer Sur. ....S.D. 2,359 ft.
United Prod. Corp.'s No. 17 Steele, 1,320 ft. N, 660 ft. W, SE cor. C. D. Steele lse., in B. C. Jordan Sur. ....Location.

Mississippi

HINDS COUNTY

Jackson O. & G. Co.'s No. 4 Mayes, 1,400 ft. E, 211 ft. S, NW cor., Sec. 1-5n-1e ....Set 10-in. 720 ft; set 6⅝-in. 2,280 ft.

RANKIN COUNTY

Love Pet. Co.'s No. 1 Hatfield, Sec. 6-5n-2e....Set 9⅝-in. 742 ft; drlg. 1,807 ft.
J. A. Matson et al's No. 1 Warner, 1,100 ft. S, 200 ft. W, NE cor. W½ SE, Sec. 14-5n-1e....Derrick.

Wildcat Operations in Mississippi

AMITE COUNTY

Company, well, farm name, section and block— Remarks:
Magnolia State O. & G. Co.'s No. 1 Anderson, C NE NW, Sec. 14-3n-3e ....Set 12½-in. 127 ft.

CLARKE COUNTY

F. X. Gowans et al's No. 1 Elfring, SE NE, Sec. 13-1n-14e.S.D. 104 ft.

HINDS COUNTY

Atkins et al's No. 1 Crane Lawrence, Sec. 23-6n-1e, 300 ft. E, 132 ft. N, SW cor. NE SE....Comp. 10,000,000 ft. gas 2,496 ft.
Love & Lancaster's No. 1 Elton Plantation, C SE, Sec. 17-4n-1e ....Drlg. 1,675 ft.

LAMAR COUNTY

Chas. W. Gorr et al's No. 1 Jordan, NW C of SW, Sec. 1-2n-15w ....Location.
Stauffer & Kouri's No. 1 Bond, SE NE, Sec. 18-2n-14w..Testing 3,011 ft.

LOWNDES COUNTY

Lowndes County Oil & Dev. Co.'s No. 1 Carr est., Sec. 34-17-16e, 1,320 ft. E, 330 ft. S, NW cor. Sec. ....S.D. 2,200 ft.

MONROE COUNTY

P. J. McAlpine's No. 1 Rye, Sec. 22-15s-17w ....S.D. 1,777 ft.

NEWTON COUNTY

Bob Dalton's No. 1 Majure, 400 ft. N, 300 ft. E, SW cor. SE, Sec. 25-6n-11e....S.D. 1,650 ft.

NOXUBEE COUNTY

Thompson & Donohue's No. 1 Donohue, Sec. 25-16n-17e..Abd. 1,735 ft.

RANKIN COUNTY

Home Oil Prod. Corp.'s No. 1 So. Jackson Land Co., 85 ft. S, 130 ft. W, NE cor. NW NW, Sec. 23-5n-1e....Set 8¼-in. 778 ft; drlg. 1,925 ft.
Love Pet. Co.'s No. 2 Int. Lbr. Co., 450 ft. S and E, NW cor., Sec. 28-6n-2e....T.A. 2,657 ft.
Majestic O. & G. Co.'s No. 1 Elton Lbr. Co., Sec. 10-4n-3e.Derrick.

SCOTT COUNTY

M. U. Culley et al's No. 1 Owens, Sec. 2-3-9....S.D. 750 ft.

Wildcat Operations in Alabama

LAMAR COUNTY
(Cable tools)

Company, well, farm name, section and block— Remarks:
DeSoto O. & G. Corp.'s No. 1 Gardner, NW NW, Sec. 22-15s-16w ....Washing to resume coring 3,184 ft. (corrected).

MOBILE COUNTY

J. C. Prine et al's No. 1 M.&O.R.R., Sec. 33-2n-4w ....Drlg. 3,020 ft.

WASHINGTON COUNTY

South Alabama O. & G. Co.'s No. 1 Wilson, Sec. 26-7n-1w.Drlg. 1,110 ft.

PERSONAL PARAGRAPHS

Roy Holloman, Denver geologist, is now in western Washington, engaged in geological work.

* * *

William D. Moorer, of the Moorlane Company, Tulsa, was in Chicago last week on a business trip.

* * *

Mr. and Mrs. Cad A. Roney have returned to Frannie, Wyo., after a trip to California and Canada.

* * *

James S. McLister, owner of oil properties in Ecuador, who has spent a few months' vacation in London, has left for Canada.

* * *

K. D. Pardee, district superintendent of the Wyoming-Montana district, of The Texas Company, with Billings headquarters, was in Casper last week.

* * *

Mrs. John Braybrook has left Petrolia, Ontario, for El Centro, Colombia, where she will join Mr. Braybrook, who is on the Tropical Oil Company staff.

* * *

R. A. Johnson, formerly of the land department, Sinclair Oil & Gas Company, now an independent oil operator with headquarters in Tyler, Tex., was in Tulsa last week.

* * *

Fritz Karge, pipe line engineer of the Union Oil Company of California, has returned to his office at the headquarters of the company following a pleasant vacation.

* * *

Art Holloway, manager of the southwestern division, pipe sales, Jones and Laughlin Steel Corporation, whose headquarters are in Dallas, Tex., was a Tulsa visitor last week.

* * *

John Lytle, of the sales department, Frick-Reid Supply Corporation, Tulsa, has returned from a trip to Pittsburgh, Pa., where he was called to attend the funeral of his brother, Dr. H. H. Lytle.

* * *

Mr. and Mrs. R. H. Baggaley and daughter of Aruba, Dutch West Indies, are visiting with Mrs. Baggaley's parents in San Angelo, Tex. Mr. Baggaley is assistant chief engineer of the Pan American Oil Corporation.

* * *

Frank Racher, David Holmes and George McDonald have returned to Petrolia, Ontario, from Odanak, Quebec, where they have completed a drilling contract for the Canadian-Seaboard Oil Company.

* * *

R. J. Riggs, chief geologist, and Thad C. Holt of the geological department of the Indian Territory Illuminating Oil Company, at Bartlesville, Okla., were in San Angelo, Tex., last week on company business.

* * *

C. J. Barkdull, vice president and treasurer of the Standard Oil Company of Indiana, R. J. Fellingham, attorney for the company, and A. W. Peake, vice president in charge of operations, spent the week in the Denver offices of the Midwest Refining Company.

* * *

George S. Buchanan, formerly in the geological department of the Standard Oil Company of Kansas, has been made chief geologist of the Barnsdall Oil Company. Mr. Buchanan, whose residence is in Tulsa, left this week for Houston, Tex., where he will spend several weeks.

* * *

H. M. Blakeslee, secretary of the accident prevention department of the American Petroleum Institute; Cecil Hightower, general chairman of the Petroleum Section of the National Safety Congress, and safety director of the Texas Pacific Coal & Oil Company, Thurber, Tex., and Joseph Risinger, safety director for the Magnolia Petroleum Company, Dallas, Tex., attended the National Safety Congress at Washington, D. C., where Messrs. Hightower and Risinger presented papers.

C. C. Pope, scout and land man for the Sun Oil Company, San Angelo, Tex., is spending his vacation with relatives in Oklahoma.

* * *

J. Edgar Pew, executive vice president of the Sun Oil Company, Philadelphia, Pa., is spending a short time in Texas on business.

* * *

R. L. Wheelock, independent operator of Corsicana, Tex., and family, have returned from a month's vacation in California. The trip was made by automobile.

* * *

Stanley Herold is conducting a class for petroleum engineers and production men in Bridge Hall at the University of Southern California. Mr. Herold, a graduate of Stanford University, is well known as a petroleum engineer and as the author of several technical books on petroleum.

Men of the Industry

J. M. PRITCHARD

Simultaneously with the creation of the position of vice president and general sales manager by the McColl-Frontenac Oil Company, Montreal and Toronto, announcement was made by John Irwin, president, that J. M. Pritchard had been chosen to fill the post. The scope of Mr. Pritchard's responsibilities thus was increased to include complete direction of sales.

After commencing his commercial career with the Canadian Bank of Commerce in Winnipeg, Manitoba, Mr. Pritchard joined the Winnipeg Oil Company in Calgary, Alberta. In 1911 he became manager of that company for Alberta, continuing until 1913. He then joined the British-American Oil Company, eventually becoming manager for its eastern division with headquarters in Montreal.

In 1923 Mr. Pritchard organized and became vice president and managing director of the Tidioute Refining Company of Canada. This company subsequently was absorbed by the Frontenac Oil Refineries, Ltd., which in 1928 was amalgamated with McColl Brothers, Ltd., of Toronto, to form the present McColl-Frontenac Oil Company. Mr. Pritchard has held the position of vice president of this company since its inception, with jurisdiction over sales in the eastern and maritime province divisions.

Carroll H. Wegemann, geologist with headquarters in Baltimore, Md., was in Tulsa this week.

* * *

R. S. McFarland of the Milham Corporation of Texas was in Tulsa during the past week.

* * *

Glenn Hawkins, geologist of the Carter Oil Company, Tulsa, has been transferred to Duncan, Okla.

* * *

H. D. Colcord, of Tulsa, chief geologist for the Superior Oil Company, made a business trip to San Angelo, Tex., last week.

* * *

Capt. J. F. Lucey, president of the Lucey Petroleum Company, Dallas, Tex., has been appointed one of the directors of the Southwestern Home Loan Bank.

* * *

A. J. Boundry of Tulsa, engineer for the Noble Drilling Company, and A. A. Kemnitz of Perry, Okla., with the same firm, were in West Texas during the past week.

* * *

F. W. Floyd, petroleum engineer of the Carter Oil Company, who has been located in southern Oklahoma, has moved to Tulsa and is making his headquarters in that city.

* * *

A. F. Stumpf was a visitor recently in Kemmerer, Wyo. Mr. Stumpf, who has been on the Pacific Coast for several years, was one of the pioneer operators in the LaBarge Field.

* * *

Charles Baron, president of the Commission des Mines de la Chambre of the French government, is now on his way to Russia to study petroleum developments in the Caucasus.

* * *

H. J. Lockhart, vice president and general manager of the Parkersburg Rig & Reel Company, with James A. Thomas, of the export department, recently spent a few weeks in England and have returned to the United States.

* * *

Charles E. Arnott, president of the Standard-Vacuum Corporation, returned to New York on the North German Lloyd liner Bremen, September 29, after having attended conferences in Paris with Rumanian oil companies.

* * *

Warner Clark, of the California Company, San Francisco, Calif., is spending a few days in the company's division offices in Dallas, Tex., of which he formerly was in charge before being transferred to the main offices in the West.

* * *

A. R. Wilson, division manager, producing department, Rocky Mountain division of The Texas Company, has returned to the Denver headquarters after a 10 days' inspection trip to the company's operations in Wyoming and Montana.

* * *

L. W. Page, former general superintendent of the Buckeye Pipe Line Company; E. U. McClintick, former oil receiver and telegraph operator, who were recently placed on the Buckeye's retired list were given a surprise party at the home of Mr. and Mrs. James June in Toledo, Ohio, on Saturday, September 24. Mr. Page was presented with a set of golf clubs and Mr. McClintick a handsome traveling bag. Those present, together with the wives of the married men and sometimes other members of the family were: L. W. Page, E. U. McClintick, J. D. Bailey, G. A. Ottney, H. J. Smith, E. F. Dunn, J. H. Hurley, D. W. McMahon, C. P. Brawley, Walter Core, Thomas Conley, M. A. Hartigan, W. E. Rowe, Fred Holcomb, H. W. Fleming, V. H. Mumaugh, Fred Blum, P. J. Flaherty, H. J. Kramb, W. A. Fowler, L. Quetschke, P. Wamer, J. K. Zimmerman, Fay Saylor, W. E. June, Ralph Tigner, James June, James June, Jr., and P. O. Hopkins. O. J. Marvin, also recently placed on the retired list, and who was to have been an honor guest, was unavoidably absent.

1859 methods

won't work in 1932

...nor will yesterday's lubrication practices work today

COLONEL DRAKE made oil history in 1859. But he would not make history if he operated today; for the equipment that he used and the months he consumed in bringing in the well would make his methods hopelessly outmoded...Your driller of 1932 is fast. He has to be. He sinks his drilling bit to a depth of three and four thousand feet in 15 working days...He operates his high speed rig efficiently and economically. No small factor of his low cost of operation is proper lubrication. It is an item to which petroleum engineers, superintendents and drillers are paying more and more attention.

Humble lubricants will help lower your drilling costs. They will make a definite contribution toward a more efficient operation.

Our engineers have made a close and exhaustive study of the lubrication needs of the modern drilling rig. We will be glad to send you a copy of the Humble Rig Lubrication Chart upon your request.

Humble Oil & Refining Company

HOUSTON, TEXAS

NATURAL GAS DEVELOPMENTS

Valuation of Lone Star Before State Commission

Present valuation of properties of the Lone Star Gas Co. and subsidiaries in Oklahoma and Texas was put at $41,391,666 by S. W. Freese, Fort Worth, Tex., auditor, at a hearing before the Oklahoma Corporation Commission. The company had claimed a valuation of $72,000,000 at a hearing last February.

The report of the appraisal was made as the commission resumed a hearing on application for a reduction of gas rates in 26 towns in Oklahoma supplied by the Community Gas Co., Lone Star subsidiary, where the rate now is an average of 76 cents per 1,000 feet.

Mr. Freese's report of the reproduction cost of the properties in Oklahoma and Texas was fixed at $53,005,251. Chairman Paul Walker, of the commission, found in the previous hearing that the valuation was approximately $50,000,000.

The value of Oklahoma properties of the Lone Star was estimated in the Freese report at $4,462,567.26.

Following a hearing several months ago at which only book values of the company were introduced in evidence, Chairman Walker announced he favored a 62-cent rate. C. C. Childers, commissioner, demanding an appraisal by auditors, said he favored a 45-cent rate on the basis of testimony introduced at the first hearing. Commissioner E. R. Hughes declined to act.

Hawley, Freese & Nichols were employed to appraise the company's properties in Texas and Oklahoma. The Texas Railroad Commission recently completed a hearing and sent representatives to attend the session at Oklahoma City.

The present value of physical properties in both States was given as $35,624,947. The present average condition of the physical properties was set at 77.22 per cent.

Reproduction of the physical property in Oklahoma would cost $5,146,502, the audit stated. Condition of Oklahoma properties was given as 78.94 per cent.

Revenues of the Lone Star Gas Co. reached their peak in Texas and Oklahoma in 1929 and have decreased steadily since that year, J. A. Phillips, Fort Worth accountant, testified. Mr. Phillips found the operating expenses of the company for 1931 were 93.4 per cent of the average annual revenue for the past five years. The company's investment in utility properties dwindled during the five-year period while sales of domestic gas increased and those for industrial purposes decreased. Gas purchased in Oklahoma cost almost twice as much as that bought in Texas fields, Mr. Phillips said.

The five-year average annual revenue of the company was given as $9,974,668, average gas purchases as $1,901,060 and average expenses as $2,567,915.

Mr. Phillips advised the commission he would make no recommendation as to whether "certain questionable items" should be taken into account in determining future income. These items, deduced by Corporation Commission auditors in a previous hearing, include management fees, donations, costs of drilling nonproducing wells and attorneys' fees.

INCREASES DISCOUNT

TOPEKA, Kans., Oct. 3.—The Western Distributing Co., one of the Cities Service subsidiaries in Kansas, has filed a new schedule for gas rates in the city of Augusta with the Public Service Commission. The company does not reduce its actual rate for gas to the consumers but is increasing its discount for the prompt payment of the gas bill. The present discount is 5 per cent and the new discount is to be 15 per cent. The result of the change is that the rate for 5,000 feet of gas used for each month will be approximately $3.86, while the old rate is $4.50 for that amount of gas, according to the estimates of the engineers of the Public Service Commission.

Old Age Pension System for Southern California

LOS ANGELES, Calif., Oct. 1.—A comprehensive old age pension plan which includes provisions for monthly disability income and for substantial life insurance should death occur before retirement has been announced to all employes of the Southern California Gas Co. by A. B. Macbeth, president.

The plan, for which every employe of at least two years' service is eligible, provides for a retirement income for men after the age of 65, and for women after the age of 60. The amount of each pension will depend upon the total salary received during the entire term of employment, with a minimum monthly pension of $45, payable to any employe of 20 years' service who has reached the retirement age. Average life insurance protection is $2,500, with $63 to $75 monthly payable during extended disability.

Each employe contributes a small percentage of his salary toward his own retirement fund. Should he leave the service of the company or die before reaching retirement age, his contributions are returnable with compound interest.

CANADIAN WESTERN GAS SALES

CHATHAM, Ontario, Oct. 1.—Gas sales of the Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary, Alberta, for July are reported at $58,586, compared with $67,405 in the same month of 1931, a decline of 13 per cent. For 1932, up to the end of July, gas sales totaled $1,399,073, an increase of 15.43 per cent over the corresponding period of 1931 when sales reached $1,212,019.

ARKANSAS RATE HEARING

LITTLE ROCK, Ark., Oct. 3.—Two utilities companies won preliminary legal skirmishes in Federal Court here against attempts to reduce their rates. Judge John E. Martineau granted temporary injunctions to the Southwestern Gas & Electric Co. of Texarkana to prevent a reduction in gas rates at Mena, and an ordinance ordering a reduction in gas rates in Little Rock was declared void by Judge Martineau on the ground the city council did not give the Little Rock Gas & Fuel Co. the required three days' notice.

GAS RATE REDUCTION

CHATHAM, Ontario, Oct. 1.—The Windsor Gas Co., distributor in the Canadian border cities for the Union Gas Co. of Chatham, has offered reductions in gas rates to small consumers involving estimated savings of $55,000 a year in the border cities area. The reductions are for a two-year period and are conditional on the stabilizing of the present rates for four years. The proposition is now being considered by the municipal authorities.

LETHBRIDGE GAS WORK

CHATHAM, Ontario, Oct. 1.—In Lethbridge, Alberta, the Canadian Western Natural Gas, Light, Heat & Power Co. is completing its program of renovating and extending the local distributing system. Some new lines are being laid to serve new residential districts. A short distance outside Lethbridge the company is replacing a portion of its transmission line near Eight-Mile Lake, where the pipe has been affected by soil corrosion.

Cleveland, Ohio, Appeals From Ruling on Revision

COLUMBUS, Ohio, Oct. 3.—The city of Cleveland has appealed to the State Supreme Court from the ruling of the Public Utilities Commission that it has no jurisdiction to order an emergency rate reduction by the East Ohio Gas Co.

The commission, by a vote of 2 to 1, dismissed a motion by the city for the reduction from the rate now being collected under bond while proceedings to determine reasonable rates are pending before the commission on appeal from an ordinance of the city fixing lower rates.

A temporary schedule of rates was sought by the city on the plea that the people of Cleveland are in financial straits and that consumers of gas should not be required to continue to pay the present rates.

In a minority opinion, filed subsequent to the dismissal order adopted by the majority, Commissioner Frank W. Geiger declared that the commission has a right to judge whether an emergency exists and temporarily to alter any existing rate.

Origin of B.t.u. Measure Is Traced Back to 1820

An effort by the librarian of the Peoples Gas, Light & Coke Co. of Chicago to trace the origin of the term B.t.u., addressed to the British Commercial Gas Association, failed to locate it. The only information the British Board of Trade could discover was that the term "British thermal unit" was used in a legal document as early as 1820.

The British Institution of Heating and Ventilating Engineers offered the following information:

"Our authority states that 'so far as my knowledge goes it is a term which has gradually evolved from the time when Lavoisier and Laplace in their experiments adopted a heat unit as a quantity of heat applied to a gramme of ice to convert it into water at freezing point. Later the large calorie, or heat required to raise one kilogram of water 1° C. was adopted and in this country the unit of heat was applied to one pound of water raised 1° F. This was called a "heat unit" in English speaking countries. Gradually English and later "British" was added to the term to distinguish it from the "French" unit or calorie. The symbol "B.T.U." was adopted to indicate "British thermal unit". In recent years some people in this country only have changed it to "B.Th.U.", although in America and abroad it is still the "B.T.U." As the temperature at which the B.T.U. is taken has never been standardized its value depends on the temperature at which the raising of one pound of water 1° F. is taken. A more accurate value is derived from Joule's experiments in 1843 when he found that the amount of heat required to raise a pound of water 1° F. was equivalent to 772 foot-pounds or Joule's mechanical equivalent of one B.T.U. More recent experiments, however, give us figures of 777.5 and 778.2 foot-pounds absorbed to produce one B.T.U. The value usually accepted is 778 foot-pounds'."

The value now commonly accepted is 1/180 of the amount of heat required to raise one pound of pure water from the ice point (32° F.) to the steam point (212° F.) both at standard pressure.

WASTE GAS PROCESS

CHATHAM, Ontario, Oct. 1.—Announcement is made that the Anglo-Persian Oil Co. has been granted Canadian patent rights on a process to utilize waste gas in the production of benzol and carbon black. By this process gas is thermally treated with steam, producing carbon black and benzol; while alcohols and derivatives are produced from the residual gases. The process is understood to be commercially applicable to the gas production of the Turner Valley Field.

Railroads Aid Coal Men Fight Natural Gas Lines

Authority has been given the railroads by the Interstate Commerce Commission to attempt to meet competition of Texas natural gas in the Middle West by reducing rates on industrial coal from mines in Illinois, Indiana and western Kentucky to destinations in Nebraska, Iowa, Kansas, Missouri, Minnesota and South Dakota. The cuts will range from 31 to 53 cents a ton. No such reductions have ever before been proposed or authorized. These cuts are to be made at points where natural gas pipe lines are now serving industries. Communities to which the pipe lines have not been constructed are to continue paying the present rate on their industrial coal. At some of the points where there are pipe lines the railroads proposed to disregard their presence and continue charging the present rates. The regulating body, however, said that they could not do that. The railroads also asked permission to make reductions to points to which plans in existence call for the construction of pipe lines, such as LaCrosse and Winona, Wis. Permission to meet competition at such points, however, was denied on the ground that the law did not authorize the regulating body to arm the railroads with power to disregard the long-and-short haul part of the law in such instances.

CALGARY GAS RATES

CHATHAM, Ontario, Oct. 1.—Reports that the Canadian Western Natural Gas, Light, Heat & Power Co. was planning to apply to the Alberta Public Utilities Commission for an increase in natural gas rates for Calgary and other communities have been denied by officials of the company.

NEW LINE TO LOUISVILLE

The Natural Gas Co-operative Market Association is considering the reconstruction of a natural gas line from Meade County to Louisville, Ky. The line which is about 25 miles long, was laid in 1888 and was in constant service until 1911. The field is reported capable of producing about 6,000,000 feet of gas daily.

VANCOUVER GAS PROJECT

CHATHAM, Ontario, Oct. 1.—Producers Natural Gas Co. has been organized at Vancouver, British Columbia, for the purpose of manufacturing artificial gas and distributing artificial and natural gas. It is understood the company contemplates marketing natural gas production developed in the Fraser Valley near Vancouver.

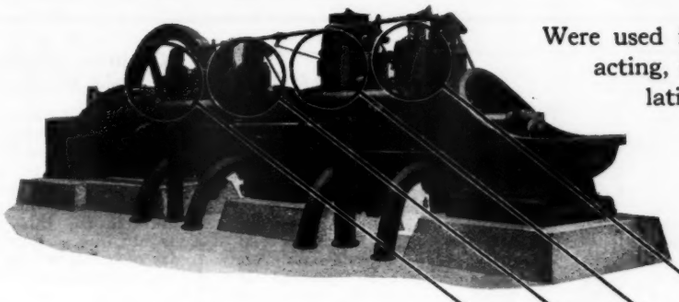
ARKANSAS TO VOTE ON GAS TAX

The people of Arkansas will be called upon to vote on a general sales tax at the election in November, which provides for a tax of 1 per cent on all sales of natural and manufactured gas in the State from the consumers.

ATLANTA SERVICE CHARGE

ATLANTA, Ga., Oct. 1.—The Georgia Public Service Commission has fixed November 21 as the date for hearings in Atlanta on the question of abolishing the $1 monthly service charge for gas consumers.

1 2 3 4



4 REGULATING AND MIXING VALVES

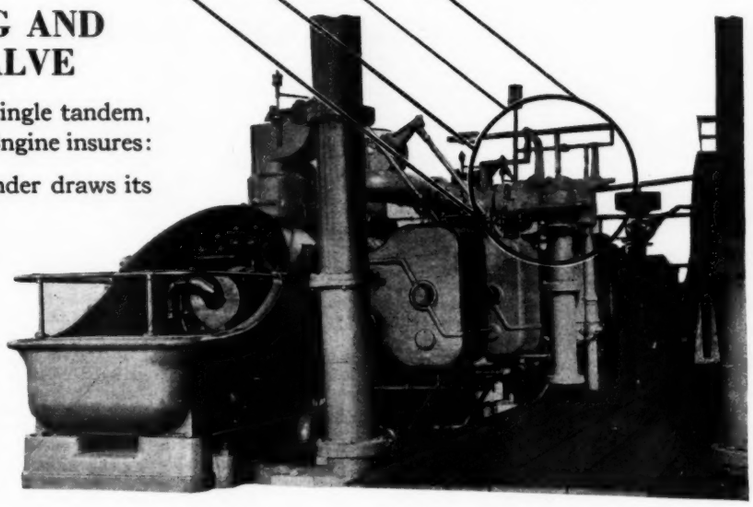
Were used formerly on single tandem, double acting, four cycle Gas Engines—one regulating and mixing valve for each end of each cylinder.

Naturally, it was impossible to keep each valve adjusted so that each end of each cylinder would take care of the same amount of load.

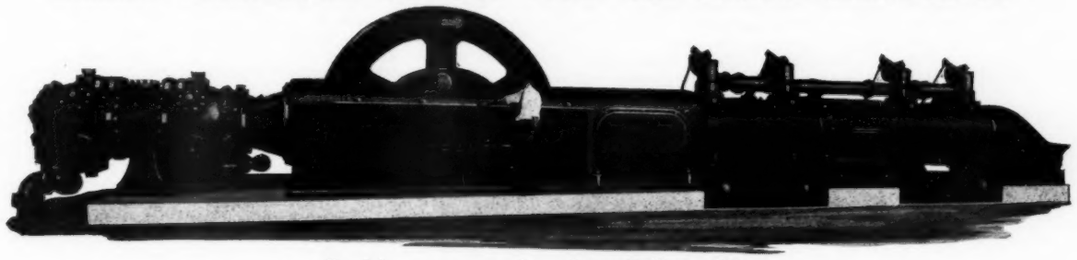
1 REGULATING AND MIXING VALVE

Used on the new TRANSIT single tandem, double acting, four cycle Gas Engine insures:

1. That each end of each cylinder draws its charge under identical conditions with the result that the work is equally divided.
2. Lowest fuel consumption.
3. Elimination of backfiring.
4. Normal operating air and gas mixture need not be enriched when starting.



TRANSIT TWIN TANDEM - 1200 H. P. - FOUR CYCLE - DOUBLE ACTING
DIRECT CONNECTED - OPPOSED TYPE - GAS ENGINE COMPRESSOR



Send for your copy of our latest Bulletin 420, descriptive of this type of gas engine.

PHOENIX, ARIZ. Pratt-Gilbert Co.
SALT LAKE CITY, UTAH F. C. Richmond Machinery Co.

NATIONAL TRANSIT PUMP & MACHINE CO. OIL CITY, PA.

LOS ANGELES Republic Supply Company of California
ST. LOUIS, MO. Reeves & Skinner Machinery Co.

New York Chicago Cleveland Pittsburgh Los Angeles Houston Tulsa

FIELD PROBLEMS FROM READERS

Edited by Thomas F. Smiley

Load Carried by the Sucker-Rod Joint Subjected to Analysis

In the interesting discussion of failures in sucker-rod joints in The Oil and Gas Journal of September 1, 1932, it is apparent of course that the load carried by the rod is a big factor and that the stress centering at the joint is a primary cause of the failures. Have any studies and experiments been made for the purpose of analyzing the load which the joint must carry under different conditions?—S. F. N.

Experimental work of the kind you name has been taken up by the Gulf Research Laboratory. Emory Kemler, of the engineering division, says a theoretical analysis of the load carried by the joint shows that the load in the joint, Q, equals the initial load, P_o, plus one-half of the applied load, F, or

$$Q = P_o + \frac{F}{2}.$$

This derivation was on the basis of the threads being nonflexible. It has been found experimentally the load carried by a joint can be represented by

$$Q = P_o + \frac{F}{4}.$$

That is, the load in the joint is the initial load plus one-fourth of the lead in the rods. The theoretical formula, on the basis of neglecting the flexibility of the threads gave

$$Q = P_o + \frac{F}{2}.$$

This shows that the flexibility of the threads has quite an effect on such a short joint.

Preliminary tests showed that the initial load in a joint under ordinary make-up conditions to be in excess of 20,000 pounds. This means that on wells 400 feet deep or less operating at ordinary speeds the initial load would be greater than the rod load and the load carried by the pin may be 50 per cent greater than the load in the rods. It can be seen then that any type of joint that would eliminate the initial tightening would have a big reduction in the load carried by the joint.

The friction in the joint when it is made up causes a torque to be put in the pin which with a 4,500-pound per square inch make-up torque would cause a stress of 12,600 pounds per square inch at the root of the thread. Since there will be a stress concentration factor of about two, the maximum torsional stress will then be of the order of 25,000 pounds per square inch.

If this stress were present it would affect the strength and would be worth studying experimentally. It is probable, however, that some of this torque is reduced when the load is applied and the joint is subjected to a vibrating load.

The distribution of the load along a pin is given by

$$P = P_o \frac{Bx - B(21 - x)}{1 - 2B1}$$

where P is the load at any section, 1 the length of thread, x the distance along the pin and P_o the initial load. B is a constant depending on the elasticity and the spring constant of the threads.

This department is conducted in order that men connected with the drilling, producing or transporting branches of the petroleum industry may obtain aid in solving problems that confront them in their work. Readers are invited to send questions freely. These questions will be placed in the hands of persons capable of answering them authoritatively, and the answers, based on the best available information, will be published.

Each question should give as much detail as possible, especially if it involves depth of sands, types of sands and operations on adjoining or nearby properties. The source of questions will be considered confidential, and only the initials of the sender will be published. Questions involving patented processes, intricate formulas or estimates of cost cannot be answered. If an immediate answer is important, one will be given by mail when the writer requests it.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or improved old ones.

Producing Life of Wells in the Oil Fields of East Texas

Could you furnish me with information pertaining to the life of an oil well or the method used to arrive at the approximate quantity of oil recoverable from a well? I am particularly interested in the East Texas Field.—L. H. H.

So far as available information goes, no formula has been established that will indicate the probable life of an oil well with such a degree of accuracy as to make it really useful. It long has been a practice to construct "decline curves," using various data in making them, but these show the trend of the production rate rather than the actual quantity of oil a given well will produce.

It is possible, on the other hand, to estimate quite accurately the volume of gas that may be recovered from a gas pool. The simple way to do this is to take the original rock pressure and after the well has produced a known quantity of gas to record the rock pressure again. There is a relationship between these two pressures and the volume of gas produced from which it is possible to determine the approximate quantity of gas that the well will yield when the rock pressure has been reduced still further. By extending this formula out to zero pressure the total yield of gas for the well can be determined.

Following this general method of determining gas reserves it is now thought by many petroleum engineers that a similar method may be devised to aid in the determination of oil reserves in pools. In the East Texas Pool many companies are taking regular readings of bottom-hole pressures in wells in all parts of the field. From these readings maps are being made showing the zones of equal pressures and by studying these progressive maps and applying numerous other data it is believed that in time it will be possible to predict the ultimate recovery of wells in this area.

However, there are many contributing factors that have a direct bearing upon ultimate recovery of any well and in the East Texas Pool at this time there are indications that relatively high recoveries will be obtained because the whole pool is being produced at a restricted rate. This controlled rate of production has given certain areas in the field opportunity to regain lost bottom-hole pressures. This building up of pressures has been attributed to movement of water in the producing zone and if this water movement can be controlled for the life of the field there seems to be possibilities that the water, which is at about 145° F. temperature, will wash the sands free of all oil and drive the oil ahead of it to the well. Such a method of production should give very high yield.

In considering this, however, it is well to remember that returns will be deferred because each well will be limited to a small amount of oil per day. However, this method of producing should give good returns on the investment and result in a greater ultimate earning than would be gained if wells were permitted to produce under the competitive system.

It is suggested that you read various articles on East Texas Field that have appeared and those that will appear in The Oil and Gas Journal.

Why Was It Called That?

CHRISTMAS TREE

Generally speaking, the Christmas tree consists of the valves, pipe and fittings used at the top of a well to control and direct the flow of oil and gas. The term usually is considered, however, to include the entire assembly of casinghead, master gates, blowout-preventer and all the valves and fittings used in completing the top of the well for production. While the origin of the name does not seem to be definitely traceable, it is believed to have grown out of the fancied resemblance between the well top thus outfitted and the Yuletide tree decorated with its multiplicity of gewgaws for the holiday celebration. Presumably a humorous allusion to one of these bedizened creations as a Christmas tree was taken up and repeated, eventually becoming established in the oil field vernacular.

Qualities of Clay Necessary to Make it Suited for Drilling

We would like to have some information concerning the purpose of clay used in making a slush sometimes used in oil well drilling, how it is used and something about the characteristics necessary to make it suitable for this purpose. Also we would like to ascertain the suitability of a clay which we have for drilling purposes.—L. W. S.

A ready way for you to ascertain the adaptability of your clay for rotary drilling purposes would be for you to take a sample of it to a laboratory in your city, capable of making an analysis and advise you as to whether your clay has any special properties that would make it suitable for this use.

In rotary drilling the hole is drilled into the earth with a bit on the lower end of a string of drill pipe, much as a hole is bored into wood, metal or any other substance. The drill stem is hollow and water is pumped down through the stem and is discharged through holes in the bit at the bottom of the hole. This water serves several purposes. It aids in softening the formation, keeps the bit cool, and in flowing back to the surface in the space between the outside of the drill stem and the walls of the hole it carries the cuttings from the bottom of the hole.

The water mixing with the earthy material broken loose by the bit forms mud. Under most conditions of drilling this natural mud is suitable for all drilling purposes and nothing is added it to. It has been found that natural mud does not contain the necessary properties for all classes of rotary drilling operations, however, and it has become common practice to use admixtures such as bentonite, baroid, oxide of iron and other elements to produce one or more desired changes in the characteristics of the mud-laden fluid.

Bentonite aids in sealing porous formations penetrated and shutting off gas flows, while baroid and oxide of iron add weight to the mud which aids in controlling gas under high pressures.

There are instances where the formations penetrated in drilling do not make a satisfactory rotary mud and brick clay has actually been used to produce a mud-laden fluid. The source of such clays must be fairly close to the drilling wells because freight is a considerable item entering into the cost, and a short haul is desirable.

Much has been written about admixtures used with mud-laden fluids in rotary drilling, and it is suggested that you study as many articles on the subject as possible. A bibliography has been mailed to you and in addition to articles listed in it the following which have appeared in The Oil and Gas Journal are recommended for your attention: "Rotary Mud Practice in the Mid-Continent," C. P. Parson, June 9, 1932; "Data on Flow of Rotary Drilling Mud," H. N. Herrick, February 25, 1932; "Drilling Mud in California Fields," A. C. Rubel, June 9, 1932; "Use of Mud in Southwestern District," Stanley Gill, June 9, 1932.

The characteristics necessary for a suitable material to be used as an admixture will vary over a wide range and it is difficult to give you an answer to that question in a letter. However, if you will refer to the articles listed you will find much information on that point.

WHEN the newer Texas fields came in with such startling success as to command the attention of the entire country, the industry found, as usual, that Halliburton was ready to serve them.

It was a tremendous job...one that required aggressive and alert attention 24 hours a day and seven days a week; but, thanks to organization and experience, it was accomplished without delay to anyone. On a single Sunday 62 wells were cemented in East Texas alone, and each received the same studied care and attention to detail as if it were the only job being handled that day.

As a result of this service, the life of the fields was lengthened, many serious dangers avoided and the yield multiplied. Just another demonstration of the value to the industry of organized responsibility!

HALLIBURTON
OIL WELL CEMENTING CO.
Duncan, Oklahoma

TECHNICAL QUESTIONS ANSWERED

By Charles K. Francis, Ph. D., Technical Editor

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas, and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

Extraction of Paraffin Wax

What is the most economical process to extract paraffin wax from say 15 to 8 gravity oils or residue from refineries?—R. I. R.

The manufacture of paraffin wax involves the separation of the wax from what is called the lubricating oil distillate or wax distillate fraction of petroleum by cooling. The wax crystallizes at the low temperature employed, the impure crystals are separated from the traces of oil by the operation known as sweating, and the final purification may require filtering through fuller's earth and treatment with chemicals.

The fraction, obtained from the distillation of a suitable crude oil, containing the paraffin wax is usually the last distillate to be obtained. The residue is fuel oil. This fraction is known by various names, such as paraffin distillate, wax distillate, lubricating distillate, wax oil and similar names. It is the source of lubricating oil and it is essential that most of the wax be removed when making the better grades of lubricating oil.

The wax distillate is chilled to about 12° F. before pumping to a plate filter press which may operate from 350 to 450 pounds, even higher pressures being used for special waxes. The chilled oil-wax is forced into the press, the oil passing through the filter cloth while the wax is retained on the surface of the plates. When the maximum pressure has been reached the press is opened and the wax removed from the plates. The oil obtained at this stage is called pressed distillate and the raw wax slack wax. The pressed distillate is then treated and filtered to make the finished lubricating oil and the slack wax passes to the next operation known as sweating.

The sweating operation is based on fractional crystallization. Any oil and amorphous wax is separated from the crystalline wax by the gradual application of heat. The sweaters consist of a series of pans, usually six to eight pans in a unit, arranged one above the other in an enclosed building. Each pan is provided with coils of pipe through which steam or water may be circulated, above the coil is a screen. The melted slack wax is run onto cold water set at a level just above the screen, then the liquid is cooled by flowing cold water through the coils, and when a cake of 4 to 6 inches has been built up the water is drawn off, leaving the wax on the screen. The doors of the unit are now closed and the temperature slowly raised. As the temperature is increased the oil and very low melting point waxes are melted out, the first product so removed being known as lightfoots oil, the next heavy foots oil, then intermediate scale and there finally remains on the screen the crude scale wax. The scale wax may be resweated a number of times until wax of the desired melting point is obtained. After the sweating the wax may be filtered or acid treated and then run into bags, barrels or moulds to form cakes. The fully refined waxes of the higher melting points are always finished in the form of cakes.

The above outline suggests that the manufacture of paraffin wax requires special apparatus and the attention of experienced operators. The equipment is expensive and under the present market conditions it appears that it is not economically possible to rerefine, involving cracking, the heavy fuels oils for the manufacture of paraffin wax. Over the period of the last three years there has been an overproduction of wax, a byproduct to the manufacture of lubricating oils, the present market price ranging from 2 to 4 cents a pound, depending upon quality. There is no simple method for the extraction of paraffin wax from petroleum oils at a low cost.

Vapor Pressure and Altitude

Will you kindly explain how any ordinary pressure gauge such as used with Reid bombs can be read in absolute pressure units? There seems to be considerable difficulty in distinguishing any difference in the action or graduation of a Reid gauge as compared to a gauge on a steam, water or gas line. If a vapor pressure test was made on a sample of gasoline at an altitude of 3,000 feet and found to be 23.5 pounds, and the bomb and gauge still assembled was moved to a point at sea level, would the vapor pressure still be 23.5 pounds?—E. J. B. and H. J. H.

The pressure indicated on the ordinary gauge is that above atmospheric, which under normal conditions at sea level is 14.7 pounds to the square inch. The true pressure existing at any point within a liquid is not related to atmospheric pressure except when the liquid is exposed to the atmosphere, then the total pressure of the vapor becomes that of the liquid plus the pressure of the atmosphere. This is known as absolute pressure or pressure absolute to distinguish it from usual pressure or gauge pressure; the steam gauge on a boiler may indicate a pressure of 150 pounds, which is equivalent to 164.7 pounds absolute, but since the atmospheric pressure is acting on all sides it would not be correct to consider the inside area of the boiler to be under a pressure of 164.7 pounds.

The gauge used in the Reid vapor pressure test is graduated to indicate pressures in pounds above atmospheric pressure. It is therefore a special gauge and the indications are not to be compared with the common gauge such as is used to indicate water and gas pressures.

The A.S.T.M. method for Reid vapor pressure, D 323 — 31 T., explains as follows: Due to the fact that the atmospheric pressure provided in the air chamber counteracts the external atmospheric pressure, the only pressure acting internally on the pressure gauge is the absolute vapor pressure of the liquid in the bomb so that the gauge reading is the absolute vapor pressure of the liquid in pounds per square inch at 100° F. For purposes of brevity the Reid vapor pressure shall be recorded in pounds, without reference to temperature used in the test (100° F.) or to unit of surface (pounds per square inch).

It is important to consider that since the external atmosphere cannot have a bearing on the Reid vapor tension, differences in temperature will have much to do with boiling point and consequently vapor-locking tendencies. The vapor tension of a gasoline at 3,000 feet will be the same at sea level. Experimental confirmation of this is shown in the table following. The samples of gasoline were tested at an elevation of approximately 6,500 feet, the samples being cooled to 32° F. before withdrawing the test portion. The cans were then sealed and shipped to an elevation of about 700 feet, where they were again cooled to 32° F. before withdrawing the test sample.

REID VAPOR PRESSURES AT TWO ELEVATIONS

Sample—	Vapor pres. lbs. (Elevation, feet) 6,500	700
A	6.0	5.9
B	4.0	4.3
C	5.5	5.5
D	4.7	4.6
E	6.5	6.1
F	6.0	5.6
G	6.3	6.5

The vapor-locking temperature decreases approximately 2.4° F. for each 1,000 feet increase in altitude. For an elevation of 3,000 feet this would mean 7.2° F. lower in the vapor-locking temperature than at sea level.

Lime and Salt for Hydrogen Sulphide Removal

Can you give me the details of the method used for washing sour gas with a solution containing salt and lime? Do you know where this method originated?—W. H. C.

"The Use of Lime in Salt Solution for Removing Hydrogen Sulphide From Natural Gas," is the title of a report by Harold P. Rue, issued as R.I. 3,178, by the U. S. Bureau of Mines. The author explains that when extracting natural gasoline from natural gas it is essential that any hydrogen sulphide be removed, if this objectionable gas is not removed, before the gasoline is obtained, some of the hydrogen sulphide may oxidize to form free sulphur and water. The sulphur will dissolve in the gasoline and cause the product to show a positive corrosion test and therefore not suitable for commercial use. Hydrogen sulphide may be removed by washing the gas with alkaline chemicals but Mr. Rue suggests a water solution of lime and salt because the required materials are easily obtained at a low price.

The treatment of a natural gas containing gasoline and hydrogen sulphide is described in this report, but the method appears to be adapted for the washing of a dry gas or the gases that are obtained from distilling or cracking oils containing sulphur compounds.

The removal of the hydrogen sulphide was accomplished by washing the natural gas by passing it through a solution of salt (sodium chloride) and lime (calcium hydroxide). The solubility of calcium hydroxide in water increases in the presence of salt, the solubility being 5.5 grams per gallon at zero sodium chloride content, and 8.75 grams per gallon in a 10 to 11 per cent sodium chloride solution. The treating plant consists essentially of a scrubbing device for contacting the gas with the solution and a series of tanks for making up or settling the treating solution. The contacting unit is a tower filled with wooden slats, the solution flowing down over the slats against the gas flowing upward. A tower of the bubble cap type is not to be used because of the possible formation of calcium carbonate which in time would plug the trays and caps.

Full details may be obtained from the circular.

Petroleum Naphtha Defined

Is there a definite meaning for naphtha, a petroleum product; that is, is naphtha a liquid of such a character that it can be identified by certain laboratory tests?—R. D.

Petroleum naphtha is a term used in the petroleum industry to indicate the liquid of indefinite properties which is closely related to gasoline but is usually somewhat less volatile than gasoline. Some refiners make use of the term as a convenient means for designating raw or unfinished gasoline to avoid confusion when handling stocks. Other refiners use the word benzine when indicating the same class of material. This liquid may require further refining in order to make it suitable for motor gasoline, such as sweetening, or it may require nothing more than the addition of a relatively small quantity of volatile gasoline to furnish enough low boiling point hydrocarbons to give the gasoline good starting qualities and to raise the gravity. What is naphtha to one refiner may be quite a different substance to another, so no set of tests could be devised which would enable one to classify it except within very broad specifications.

The general nature of the meaning of the terms is shown by the tentative definition adopted by the American Society for Testing Materials under D 288—31 T, report of Committee D-2, Tentative Definitions of Terms Relating to Petroleum, as follows:

Petroleum Naphtha — A generic term applied to refined, partly refined or unrefined petroleum products and liquid products of natural gas, not less than 10 per cent of which distills below 347° F. (175° C.) and not less than 95 per cent of which distills below 464° F. (240° C.), when subjected to distillation in accordance with the Standard Method of Test for Distillation of Gasoline, Naphtha, Kerosene and Similar Petroleum Products (A.S.T.M. Designation: D 86) of the American Society for Testing Materials.

Note—The "naphthas" used for specific purposes such as cleaning, manufacture of rubber, manufacture of paints and varnishes, etc., are made to conform to specifications which may require products of considerably greater volatility than that set by the limits of this generic definition.

NEW AND IMPROVED EQUIPMENT

Commutator Type Contact Is Developed by Foxboro

Rotax stands for rotating contacts. These commutator type contacts are the outstanding feature of the new electrically operated control instrument developed by the Foxboro Co., Foxboro, Mass. It is asserted that the commutator type contact gives more accurate control, that it

allows uninterrupted pen travel and gives positive contact at all times with a minimum of arcing. It can be set from outside the case.

The new instrument is used to control temperature, pressure, humidity, flow, or liquid level and to give audible or visible signals. It is designed to operate valves, compressors, blowers, motors, heating units of all kinds, horns, lights and other electrical equipment. It has a wide variety of industrial applications, including pressure control of gas lines, air lines, etc.

The instrument is so designed that it is possible to use a simple, positive lock-up type of relay in the circuit. The contacts carry only the relay load. Flexibility of design permits various combinations of commutators so that special signaling or control problems may be met. If it is desirable to control time, a special time cycle feature may be added. Further information on the construction or uses of Rotax may be had by writing to the Foxboro Co.

OPERATIONS ARE CONSOLIDATED

Abel Davis and Franklin H. Fowler, receivers in equity for Foote Bros. Gear & Machine Co., are making arrangements with the approval of the Federal court to move all manufacturing operations of the company now being carried on at the Curtis Street plant, Chicago, to the Plamondon division at 5301 Southwestern Avenue, Chicago. At the same time some surplus machinery will be disposed of. This consolidation of manufacturing operations of the gear and reducer division in one modern plant will effect savings in production costs and operating expenses and will speed up deliveries. The new Plamondon plant, a one-story plant of large floor area, is located on a siding of the Chicago Belt Line Railway and is equipped with five heavy-duty cranes and many smaller cranes for handling materials and heavy equipment in minimum time and at minimum cost. The moving of the machinery will be made on a carefully planned schedule to preclude interruptions or delays in deliveries on customer's orders in the interim. It is expected that the move will be completed by about October 1.

Among the Equipment Houses

Rounding out 47 years in the employ of the General Electric Co. and its predecessors, William S. Culver, district engineer of the east central district of the company, with headquarters in Cleveland, Ohio, will retire from active duty at the end of September. C. W. Fick, assistant district engineer, will succeed Mr. Culver.

—

The Champion Rivet Co. of Cleveland, Ohio, for 40 years in the business of making rivets, has entered the welding rod industry.

—

The Jeffrey Manufacturing Co., Columbus, Ohio, has moved its southwestern branch office from Houston to Dallas, Tex. T. P. Burke continues as manager.

—

The Timken Steel & Tube Co. of Canton, Ohio, has appointed Frank L. Gibbons director of steel sales. Mr. Gibbons in 1924 entered the service of the old Carbon Steel Co. Subsequently he was engaged in sales work for the Central Steel Co. and the Central Alloy Co. He goes to Timken from the Republic Steel Corp., with which he had been connected since its merger with Central Alloy.

—

The Henry Vogt Machine Co. of Louisville, Ky., has appointed J. R. Fortune & Son, 608 Fisher Building, Detroit, Mich., as its district representatives for steam boilers, Homoweld pressure vessels and heat exchange equipment.

—

The Gates Rubber Co., Denver, Colo., has completed arrangements with the Gaso Pump & Burner Co., Tulsa, which has been using Gates Vulco ropes as standard equipment on its units, to carry a service stock of belts.

FWD Announces 1933 Truck Designed for Oil Field Use

The Four Wheel Drive Auto Co. of Clintonville, Wis., has announced a new line of heavy-duty trucks for 1933. The models range in size from the 2 to 2½-ton four-wheel-drive to the 15-ton six-wheel drive, and incorporate improvements. Special mention is made of three primary models, the X6 for oil field service; the H6, of 2-2½ tons capacity, for road maintenance, and the CU6, of 3½-4 tons capacity, for road building and snow removal. Each incorporates the basic four-wheel-drive principle of propulsion.

The X6 model of 6 to 10 tons capacity is a four-wheel-drive six-wheeler, designed especially for the heavy hauls encountered in the oil industry. Radically different from the conventional four-wheel-drive six-wheelers, this unit is powered on the front and first rear axle. The extreme rear axle is a load-carrying member only. This permits the use of the regular FWD center differential between the driving axles, to compensate for the variations in wheel travel when turning corners or traveling over rough roads. Power is supplied by a 110-horsepower six-cylinder engine of 517 cubic inch displacement and is featured as economical to operate. According to the manufacturers, the new manifold design, combined with the patented high-turbulence head, is responsible for the increased power and economy of operation.

The cab is built along aero-dynamic lines, without an external visor and is equipped with dual windshield wipers. The dial instruments are of the airplane type with needle indicators and crowned glass faces. The service brakes are air-operated by individual diaphragms on each one of the six wheels, these diaphragms being mounted directly on the backing plates.

—

The American Instrument Co., Inc., 774 Girard Street, N. W., Washington, D. C., has prepared a bulletin on the Vogel-Ossag viscometer for the direct measurement of kinematic and absolute viscosities.

—

A folder presenting facts about its "built-in" Capacitor motor is being sent on request by the Howell Electric Motors Co., Howell, Mich.

Temperatures Controlled by New Regulating Device

The Red Top terminal type thermoregulator, developed by Hiergesell Brothers, 2518 North Broad Street, Philadelphia, Pa., is designed to control constant temperatures with accuracy and is expected to find a ready demand in the oil industry. The device is said by the manufacturers to control any desired temperature to a variation of one-tenth of 1 degree, within a range of 0° to 300° F.

Features of this new appliance are enumerated by the manufacturers as follows:

The mercury is purified through a special process.

The capillary and reservoir are filled with dry hydrogen to dampen spark at contact point.

The electrodes, or contacts, are of a special alloy metal, expressly designed to contact on top of mercury.

Terminals for connecting control circuit eliminate danger of breaking leads to electrodes.

Outer glass shell, completely enclosing delicate parts, adds rigidity to the completed instrument.

Relays are so designed as to operate within 12 milliamperes at 110 volts, 60 cycles, through protecting condenser and resistors, which are mounted on one base.

Relay contacts will carry loads up to 30 amperes (3,000 watts) at 110 volts, A. C.

STARTER PROTECTED FROM DUST

A synchronous motor starter, entirely enclosed in cubicles for protection against dust, was recently built and shipped from the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Co. In it are three compartments. One contains an incoming line circuit breaker with disconnect switches. Each of the others houses an individual synchronous motor starter with an electrically operated breaker and an individual disconnect switch. Each compartment is provided with a lock to prevent unauthorized attention, and no operation can take place from without the cubicle except starting and stopping the motors, which is accomplished from a remote push button station. The individual motor generator exciters are controlled from the same push button that starts the synchronous motor.

Men Well Known in the Equipment Field

GEORGE H. GLEESON

An arrangement has been made for the joint use of the manufacturing, engineering, sales and service facilities of the meter division of the Worthington Pump & Machinery Corp., Harrison, N. J., and those of the Gamon Meter Co., whose plant is at 282-296 South Street, Newark, N. J. The sales staffs of both organizations will report to and be directly responsible to George H. Gleeson, who will head up the meter sales activities of both companies.

The lines made by these two companies are supplemental to each other, with the result that the products of both will continue to be produced as heretofore and together make a complete line of disc, current or turbine, compound and piston meters for measuring all liquids, such as hot and cold water, oil, grease, gasoline and brine.

The Gamon Meter Co., founded in 1910, and its line of disc, current and compound meters, are widely known. The first water meter was an invention of Henry R. Worthington, and for 74 years Worthington has been a factor in this business.

General Electric Develops Mechanical-Drive Turbine

A new mechanical drive, noncondensing steam turbine for driving centrifugal pumps, fans and other rotating equipment has been developed by the General Electric Co. This turbine is suitable for driving equipment at speeds from 1,200 to 4,000 r.p.m. and is available up to 250 horsepower under suitable steam conditions. It is a single-stage machine with two rows of revolving buckets and is an addition to the standard line of General Electric mechanical drive turbines.

The wheel casing is split horizontally to allow easy access to the internal parts and the steam and exhaust pipes are connected to the lower half of the machine. A centrifugal governor, with weights pivoting on knife edges, operates with little friction and provides proper speed regulation. An independent emergency governor is included. The new turbine bears the type designation D-59 and, except for being larger, is similar to the type D-57.

Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS Pipe Line Statement for July Runs

	Month bbls.	Dly. av. bbls.
Gulf P. L. Co.	1,552,253	50,073
Texas P. L. Co.	648,246	20,911
Magnolia Pet. Co.	1,206,952	38,934
Empire P. L. Co.	1,818,901	58,674
Cosden P. L. Co.	550,248	17,750
Stanolind P. L. Co.	2,650,500	85,500
Oklahoma P. L. Co.	1,893,004	61,065
Other lines	5,712,000	184,258
Total July	16,032,104	517,165
Total June	15,594,950	519,832
Difference	437,154	2,667

Shipments

Gulf P. L. Co.	1,953,357	63,012
Texas P. L. Co.	875,544	28,243
Magnolia Pet. Co.	1,391,845	44,898
Empire P. L. Co.	2,132,851	68,802
Cosden P. L. Co.	538,328	17,365
Stanolind P. L. Co.	3,648,700	117,700
Oklahoma P. L. Co.	2,047,825	66,059
Other lines	5,416,000	174,710
Total July	18,004,450	580,789
Total June	15,652,178	555,073
Difference	2,352,272	25,716

Stocks

Sinclair Prairie Oil Co.*	34,505,000
Gulf P. L. and Gypsy Oil Co.	7,472,637
The Texas Company	2,566,373
Magnolia Petroleum Co.	7,858,032
Empire P. L. Co.	5,196,710
Mid-Continent Petroleum Corp.	2,394,483
Stanolind Crude Oil Pur. Co.*	15,939,000
Oklahoma P. L. Co.	2,035,457
Carter Oil Co.	2,638,254
Other lines*	15,989,000
Total July	96,594,946
Total June	97,460,908
Difference	865,952

*Estimated. Stanolind Pipe Line Co.'s shipments include Texas crude oil.

EASTERN PIPE LINE REPORT FOR MONTH OF AUGUST

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for July and August:

	July, 1932	Aug., 1932
Nat. Transit	257,678.41	275,750.53
S. W. Pa. P. L.	66,303.16	62,129.52
Eureka P. L.	254,345.02	266,577.80
Buckeye P. L. (Macksburg)	224,866.44	237,716.09
Buckeye P. L. (Cleveland)	10,799.40	11,208.49
Buckeye P. L. (Lima, etc.)	79,881.40	81,587.39
Indiana P. L.	2,177.70	2,458.46
N. Y. Transit	38,863.85	39,020.34
Tide Water P. L.	22,948.60	25,557.98
Pure Oil	444,629.57	516,375.91
Stoll Oil Ref.	36,275.24	50,898.63
Bradford Trans.	393,640.88	381,997.45
Ashland Ref.	133,060.97	146,696.38
Total	1,965,470.64	2,097,974.97
Daily average	63,402.28	67,676.61

Petroleum Deliveries

The following table exhibits the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for July and August:

	July, 1932	Aug., 1932
Nat. Transit	496,936.68	534,240.67
S. W. Pa. P. L.	516,488.97	426,871.06
Eureka P. L.	316,502.51	252,456.47
Buckeye P. L. (Macksburg)	268,503.80	249,820.07
Buckeye P. L. (Cleveland)	1,231.63	1,953.72
Buckeye P. L. (Lima, etc.)	1,645,800.68	1,472,333.62
Indiana P. L.	985,847.69	886,983.80
Southern P. L.	65,700.09	69,501.52
N. Y. Transit	208,180.19	179,437.69
Northern P. L.	105,941.67	24,426.40
Tide Water P. L.	438,003.22	391,155.65
Pure Oil	555,295.02	688,907.47
Bradford Trans.	423,645.01	441,852.71
Tuscarora Dev.	262,578.32	203,088.81
Total	6,288,655.47	5,823,029.66
Daily average	202,859.85	187,839.66

Gross Stocks

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of July and August:

	July, 1932	Aug., 1932
Nat. Transit	660,353.47	685,167.99
S. W. Pa. P. L.	544,191.17	549,692.76
Eureka P. L.	1,151,492.16	1,004,657.06
Buckeye P. L. (Macksburg)	287,514.51	289,650.01
Buckeye P. L. (Cleveland)	32,720.25	52,664.82
Buckeye P. L. (Lima, etc.)	2,959,286.50	2,989,681.41
Indiana P. L.	460,012.73	490,709.25
Southern P. L.	158,254.77	226,712.22
N. Y. Transit	97,545.73	92,271.56
Northern P. L.	271,630.29	235,956.96
Tide Water P. L.	622,396.64	728,922.28
Pure Oil	676,763.36	575,085.28
Tuscarora	8,601.80	2,723.09
Bradford Trans.	246,193.50	204,681.76
Total	8,176,956.88	8,128,576.45
Decrease	555,767.81	48,380.43

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of July and August showing gross stocks of the above fields:

	July, 1932	Aug., 1932
Pennsylvania	2,938,186.48	2,998,082.78
Lima	437,722.43	475,348.21
Kentucky	1,205.71	10,312.03
Mid-Continent	4,145,012.16	4,124,644.74
Illinois	8,491.31	21,067.44
Michigan	596,338.79	499,121.25
Total	8,176,956.88	8,128,576.45

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1929	1930	1931	1932
Jan.	51,749	75,907	53,939	53,501
Feb.	51,833	79,256	55,163	55,498
Mar.	54,252	76,688	54,331	57,199
Apr.	58,444	84,536	54,914	57,348
May	59,902	70,546	54,344	59,105
June	58,833	75,430	54,110	64,371
July	66,087	68,921	50,723	63,402
Aug.	66,087	54,291	51,503	67,676
Sept.	67,815	56,595	61,345	.....
Oct.	76,093	58,179	65,595	.....
Nov.	74,831	52,332	58,819	.....
Dec.	74,561	53,999	61,835	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1929	1930	1931	1932
Jan.	165,721	217,623	175,369	186,551
Feb.	159,387	224,355	183,494	169,856
Mar.	161,474	228,846	189,508	188,793
Apr.	169,737	241,845	191,450	202,036
May	184,281	248,383	199,247	201,404
June	185,404	234,401	221,155	201,632
July	194,763	207,094	211,632	202,859
Aug.	194,946	205,506	224,166	187,839
Sept.	201,214	193,999	217,537	.....
Oct.	191,367	157,675	210,831	.....
Nov.	202,743	146,638	196,425	.....
Dec.	186,257	143,001	176,241	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1930	1931	1932
Jan.	12,220,045	11,831,092	9,023,914
Feb.	12,991,561	11,506,489	8,974,350
Mar.	13,247,217	11,012,162	8,802,192
Apr.	13,233,961	11,044,481	8,908,661
May	13,052,953	10,728,239	8,835,726
June	13,396,855	9,903,349	8,732,724
July	13,268,562	9,569,849	8,176,956
Aug.	13,047,051	9,192,457	8,128,576
Sept.	12,812,018	8,492,431	.....
Oct.	12,437,553	8,417,694	.....
Nov.	11,851,380	8,830,386	.....
Dec.	11,751,952	9,119,032	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, September 1	484,480.80
Runs from wells	450,537.55
Other receipts	49,178.17
Regular deliveries	280,690.51
Other deliveries	239,137.27

The amount of Illinois oil run by the Tide Water Pipe Co. in August was 25,557.98 bbls. Deliveries were 26,635.28 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

	Runs	Deliveries
1932—		
Aug.	476,095.53	307,325.89
1931—		
Jan.	468,429.04	664,573.19
Feb.	429,284.54	461,262.85
Mar.	424,638.23	356,663.26
Apr.	421,814.98	282,532.65
May	433,231.80	322,513.95
June	510,805.78	320,258.13
July	520,009.38	289,219.05
Aug.	476,623.56	393,231.06
Sept.	492,183.83	323,012.50
Oct.	498,124.13	325,834.95
Nov.	470,302.63	281,258.48
Dec.	515,771.28	306,623.19
1932—		
Jan.	500,177.12	246,634.10
Feb.	482,561.50	186,010.30
Mar.	565,538.70	270,617.75
Apr.	461,920.92	285,817.98
May	521,884.64	279,859.88
June	501,878.26	263,703.70
July	466,635.89	284,537.18

Tide Water Pipe Co., Ltd., also delivered in August 96,170.37 bbls. Oklahoma oil.

Average Daily Imports of Crude and Refined Oil at Principal United States Ports

Average barrels per day in 1931-32—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans, Baton Rouge	Port Arthur, Sabine Pass	Tampa	Total	Total all ports
August	32,613	15,581	91,742	22,387	25,741	188,064	4,161	2,516	.....	3,162	9,839	197,903
September	27,067	7,267	106,867	20,099	22,967	184,267	4,833	8,333	.....	.....	13,166	197,433
October	53,710	14,484	100,774	26,742	40,645	236,355	6,097	6,871	2,097	1,838	16,903	253,258
November	45,033	28,800	51,667	28,600	12,967	170,067	3,933	10,833	3,033	1,367	19,166	189,233
December	20,258	16,806	121,807	31,645	34,258	224,774	1,968	4,355	.....	.....	6,323	231,097
1932—												
January	19,161	8,161	104,065	24,194	34,903	190,484	4,871	7,226	2,096	1,484	15,677	206,161
February	32,483	16,517	128,483	28,862	34,552	240,897	2,034	5,207	4,310	1,379	12,930	253,827
March	25,806	10,516	167,806	38,677	48,129	290,935	5,936	39,774	.....	1,516	47,226	338,161
April	37,167	18,467	158,233	38,733	39,400	292,000	6,767	44,600	2,167	3,333	54,867	346,867
May	31,161	2,065	170,226	50,774	14,935	269,161	903	710	4,194	1,516	7,323	276,484
June	30,908	11,700	199,300	22,733	29,900	294,533	.....	.....	12,867	.....	12,867	307,400
July	2,613	2,161	62,968	14,935	2,129	84,806	.....	.....	.....	.....	.....	84,806

Average Daily Receipts of California Crude and Refined Oil at Atlantic and Gulf Ports

Average barrels per day in 1931-32—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans, Baton Rouge	Port Arthur, Sabine Pass	Tampa	Total	Total all ports
August	3,452	.....	16,419	7,419	4,290	31,580	.....	.....	.....	.....	968	32,548
September	4,267	3,667	12,933	4,699	7,367	32,933	.....	.....	.....	.....	4,000	36,933
October	2,355	1,129	19,290	16,709	9,323	48,806	.....	.....	.....	.....	3,323	52,129
November	1,000	.....	22,800	11,567	.....	35,367	.....	.....	.....	.....	3,366	38,733
December	3,161	.....	22,484	3,839	6,032	40,516	.....	.....	.....	.....	7,742	48,258
1932—												
January	3,871	1,710	14,483	3,774	5,710	29,548	.....	.....	.....	.....	.....	29,548
February	3,049	.....	9,103	4,862	.....	17,034	.....	.....	.....	.....	2,483	19,517
March	1,516	.....	6,065	.....	.....	7,581	.....	.....	.....	.....	.....	7,581
April	3,500	.....	19,333	3,867	4,333	31,533	.....	.....	.....	.....	.....	31,533
May	2,161	.....	15,226	13,774	3,871	40,032	.....	.....	.....	.....	.....	40,032
June	2,500	.....	17,333	3,933	833	24,600	.....	.....	.....	.....	.....	24,600
July	2,323	.....	22,226	8,677	8,935	42,161	.....	.....	.....	.....	.....	42,161

Gross Production of Crude Oil in the United States for 12 Months

(In Barrels of 42 Gallons)

1931—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
August:	Month	15,668,984	9,617,279	32,279,816	3,141,323	1,165,569	1,584,444	2,807,143	3,167,000	69,331,556
	Daily average	505,451	307,009	1,041,284	101,333	37,599	51,111	90,553	102,161	2,236,502
September:	Month	15,180,610	7,946,880	28,981,525	3,147,030	1,138,380	1,641,384	2,761,230	3,632,000	64,429,039
	Daily average	505,020	264,896	966,051	104,901	37,946	54,713	92,041	121,067	2,180,968
October:	Month	15,651,983	12,951,893	30,725,173	3,177,066	1,172,389	1,822,255	2,797,597	3,900,000	72,198,354
	Daily average	504,902	417,802	991,134	102,486	37,819	58,782	90,247	125,807	2,328,979
November:	Month	14,997,700	16,430,730	28,860,561	3,121,670	1,130,700	1,851,577	2,706,390	3,639,000	72,748,328
	Daily average	499,923	547,691	962,018	104,389	37,690	61,719	90,213	121,300	2,424,946
December:	Month	15,560,984	16,598,299	27,767,651	3,198,642	1,082,148	1,971,817	2,816,759	3,645,000	72,641,300
	Daily average	501,967	535,429	903,860	103,182	34,908	63,607	90,863	117,581	2,343,268
1932—										
January:	Month	15,532,141	13,664,149	26,409,838	3,170,587	1,101,616	1,792,398	2,444,164	3,566,000	67,680,893
	Daily average	501,037	440,779	851,930	102,277	35,536	57,819	78,844	115,032	2,183,255
February:	Month	14,616,862	11,806,190	23,858,375	2,838,839	1,008,562	1,617,087	2,420,224	3,294,000	61,460,139
	Daily average	504,030	407,110	822,703	97,891	34,778	55,762	83,456	113,586	2,119,315
March:	Month	15,575,915	12,998,796	26,162,647	3,042,929	1,062,897	1,703,145	2,617,392	3,553,000	66,716,721
	Daily average	502,449	419,316	843,956	98,159	34,287	54,942	84,432	114,613	2,152,152
April:	Month	15,524,444	12,718,020	26,362,851	2,974,080	1,048,620	1,858,957	2,525,040	3,684,000	66,696,012
	Daily average	517,481	423,934	878,762	99,136	34,954	61,965	84,168	122,800	2,223,200
May:	Month	15,575,741	13,169,420	27,328,472	3,038,930	1,064,602	2,012,701	2,600,683	3,809,000	68,599,549
	Daily average	502,443	424,820	881,544	98,030	34,342	64,926	83,893	122,871	2,212,889
June:	Month	14,113,970	12,757,230	26,161,092	2,837,179	1,022,970	1,857,433	2,416,680	3,699,000	64,870,554
	Daily average	455,451	425,241	872,036	94,573	34,099	61,914	80,556	123,300	2,162,352
July:	Month	14,627,550	13,030,571	26,946,714	2,906,808	1,060,386	1,933,757	2,554,648	3,640,000	66,700,434
	Daily average	471,856	420,341	869,249	93,768	34,206	62,379	82,408	117,419	2,151,627
		182,631,884	153,589,457	331,844,715	36,605,083	13,058,839	21,646,955	31,467,950	43,228,000	811,072,883

CLASSIFIED ADVERTISING

Classified Rates

The rates for Classified Advertisements are 35 cents a line for the first insertion and 25 cents a line for each additional insertion. Six words usually constitute a line. The following table will enable you to figure the cost of your advertisement:

	1 time	2 times	3 times	4 times
3 lines ..	1.05	1.80	2.55	3.30
4 lines ..	1.40	2.40	3.40	4.40
5 lines ..	1.75	3.00	4.25	5.50
6 lines ..	2.10	3.60	5.10	6.60
7 lines ..	2.45	4.20	5.95	7.70
8 lines ..	2.80	4.80	6.80	8.80
9 lines ..	3.15	5.40	7.65	9.90
10 lines ..	3.50	6.00	8.50	11.00

Compute white space at the above rates.

Mail your Classified Advertisement to

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

For Sale—Equipment

TWO 1,500-gallon and one 600-gallon tank trucks also one 600-gallon trailer. Must be sold immediately. Price very cheap. Ivory Oil Company, 6 North Michigan Avenue, Chicago, Illinois.

200 AMP. General Electric Arc Welder; portable; 220 V. 3 ph. 60 cy. Complete. Like new. $350. 7x8 Ingersoll-Rand Type ER-1 Air Compressor. Like new. $225. 8x6 Ingersoll-Rand Type ER-1 Air Compressor. Like new. $250. 36"x18' Fifield Screw Cutting Lathe. $650. Also large stock of lathes, shapers, pipe machines, bolt threaders, etc. Send for our list. Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West Second St., Cincinnati, Ohio.

2½" AND 3" UPSET tubing 15c and 20c per foot. One 10x4½x10 Worthington Pump $325. One good string of used 6" drill pipe, cheap. Various high pressure gate valves and fittings at 50% of cost new.
CARSON MACHINE & SUPPLY CO.
Oklahoma City, Okla.
Box No. 1093 Phone 2-5972

BARGAINS—One 90 H.P. Acme Boiler, One 80 H.P. Clark Gas Engine, Ten Griscom cooling sections (Bentube), P.E. pipe from 4" to 12" and other equipment at our gasoline plant at Allen, Okla. Phone L.D. 501 or write Tulsa. Producers Pipe & Supply Co.

FOR SALE—Bargains—Arc Welders, gasoline or electric drive. 30 Days' Trial. Terms if desired. Write Ken's Equipment Exchange, Box OG-82, Troy, Ohio.

PRACTICALLY new Landis Pipe Machine, threads up to 15½, bargain cash price $3,950. Wire E. C. Stovall, Graham, Texas.

Used Pipe and Supplies
Laurie Engineering Company
1120 Walnut Kansas City, Mo.

Equipment Wanted

WANTED—Electric light plant capable of producing 1,000-H.P. Same must be cheap and in first class condition. Address Box F-350, The Oil and Gas Journal, Tulsa, Okla.

WANTED—Compression gasoline plant equipment for 1,000,000 ft. Give description, price, location and condition first letter. Address Box F-362, The Oil and Gas Journal, Tulsa, Okla.

Wanted

WANTED natural gasoline. 200 gallons at market price, from small producer. John Chambers, W. Wilson St., Ottawa, Kans.

Business Opportunities

HAVE FAULT Structure with complete surface and subsurface geology. Extremely favorable for duplicating discovery of another major oil pool on same fault trend. Desires party take quarter interest. P. O. Box 1777, Fort Worth, Tex.

INCORPORATE your business. Delaware. Sell shares. Raise capital. Cost $22. Small service fee. Free details. Corporation Fiscal Company, Wilmington, Delaware.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Situations Wanted

REFINERY SUPERINTENDENT and Chemist. Ten years' complete plant experience, technical training. Available at once. Address Box F-224, The Oil and Gas Journal, Tulsa, Okla.

REFINER, Design, const. operate skim. lub. and cracking plants, eighteen years' experience. Address Box F-221, The Oil and Gas Journal, Tulsa, Okla.

15 YEARS' experience gas measurement in field and city distribution. Maintenance of most all make of meters, regulators and pipe line. Go anywhere. W. O. McPherson, Route 2, Box 43, Luther, Okla.

Patent Attorneys

REGISTERED PATENT ATTORNEYS
United States and Canada
Before disclosing your invention to anyone, send for blank form, Evidence of Conception.
Bulletin "How to Establish Your Rights" and complete information free.
LANCASTER, ALLWINE & ROMMEL
Suite 418, 815-15th St., N.W.,
WASHINGTON, D. C.

Special Notices

ASK Librarian for "Notes on Carrie Nation, Kansas' bravest Woman," by Beulah Allred, Topeka, Kans.

Money Raising

JAMES E. MILLER CO., 207½ E. Third St., Tulsa, Okla., will co-operate with responsible parties seeking aid in financing projects of higher order. Valuations, Engineering, Geology.

FINANCE YOUR OWN project with shares bonded. Quickest, most satisfactory known method of raising capital. Information free. Bankers Interstate Security, Electric Bldg., Denver, Colo.

JOHN MORRIS, 3608 WARREN ST., PHILADELPHIA, Pa., invites full facts first letter from capable parties planning negotiation of reasonable capital support for undertakings distinctly of higher order. Use registered mail, safeguard data.

CORPORATE Organizing and Financing—confidential correspondence solicited.
BROOKWORTH,
110 East 42nd St., New York City.

MAILING Lists, form letters, sales prospectus, advertising copy. Write S. F. Gingerich, P.O. Box 1841, Tulsa, Okla.

Incorporations

CHARTERS—Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

Royalties—Production

MONTHLY INCOME-PAYING Royalties under Oklahoma City and Seminole Wilcox Sand wells offered. W. E. Cook, 342 Court Arcade, Tulsa, Oklahoma.

THE VERY BEST ROYALTIES in denominations suitable to the largest or smallest investor. B. L. Abicht, 609 Ritz Bldg., Tulsa, Okla.

HIGH GRADE producing oil and gas royalties offered to dealers. Billie Smallwood, P. O. Box 2261, Tulsa, Okla.

Dealer in Odd Lots
PRODUCING OIL ROYALTIES
I Buy and Sell
John L. Dickson, Box 1113, Tulsa, Okla.

James B. McAnally
Speculative and Investment Royalties
Hunt Bldg., Tulsa, Okla.

PRODUCING AND NON-PRODUCING
OIL AND GAS ROYALTIES
THE MERCURY COMPANY
Philtower Building, Tulsa, Oklahoma.

PRODUCING AND NONPRODUCING royalties in Kansas, Okla., and Texas. Special service to investors and brokers. James R. Haynes, Grantville, Kans.

PRODUCING OIL ROYALTIES
Henry S. Severson, Alexander Bldg.
P.O. Box 1341 Tulsa, Okla.

KANSAS Producing Royalties Small lots Few good leases, list and maps.
Harry Haynes, Grantville, Kans.

Income Producing Royalties
Mid-Continent Field
Harry A. George
Exchange Bank Bldg., Tulsa, Okla.

ASSOCIATED INDUSTRIAL ENGINEERS
Milam Building San Antonio, Texas
Branch offices in principal Oil centers
PETROLEUM ROYALTIES AND LEASES SCIENTIFICALLY SELECTED, APPRAISALS, REPORTS. Large Staff, Experienced Geologists and Technologists. A complete Service including listing of properties for sale. Write us your requirements or offerings.

BOTTOM PRICES. Perpetual royalty under undrilled major leases. $6 per square mile. Safest play. Longest profits. See maps, R. R. Fisk, Box 392-B, Wichita Falls, Texas.

SOME OF THE VALUABLE ARTICLES in the current number of THE ROYALTY AGE are: "Oil Royalties for Profit," "Royalty Romance," "The Oil Royalty Business Has Arrived," "Legal Status of the Oil Royalty." Also editorial news, data, statistics and reports.
Profit by reading America's high class monthly royalty magazine. Mail your $2.00 yearly subscription order now.
THE ROYALTY AGE
114 Mid-Co Building Tulsa, Oklahoma
Read by Royalty owners, Investors, Stockholders and Dealers in United States, Canada and Europe.

WILL SELL 500 full acres of perpetual royalty undivided under 9,102 acres for only $500. Terms are half down balance 30, 60 and 90 days. In fourteen separate deeds located in Oklahoma and Texas. D. M. Henry, Wichita Falls, Tex.

NEED CASH?

Why not dispose of that second hand equipment, at a nice profit, before the weather disposes of it for you, at a total loss.

Jot down a list of the second hand equipment you want to turn into cash and mail it to the Classified Department of

The Oil and Gas Journal
TULSA, OKLAHOMA

Display Rates

The rate for Classified Display Advertising set in similar style to this Ad or in two Column style is as follows for each insertion:

1 inch	1 time	$5.00
1 inch	13 times	4.50
1 inch	26 times	4.00
1 inch	52 times	3.50

Rates for Classified without display shown on opposite column.

One point borders and ten point capitals are allowed, larger type not accepted.

Changes in copy must be in our office 10 days in advance of publication date.

Mail your advertisement to the Largest Classified Section in the Oil Industry.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Leases—Production

FOR SALE—More than 100,000 acres of foreclosed lands in 125 Texas counties. These lands are in tracts of various sizes. Oil production or activity in over half these counties. For further information write P. W. Chunn, P.O. Box 118, Houston, Texas.

LOCATING Oil and Gas before drilling, good references. Acreage for drilling. E. Fackler, 4020 Walnut, K. C., Mo.

$200 BUYS A SMALL oil lease in Carter's Block in NW ¼ of Section 7, Twp. 12 north, R. 3 West, Oklahoma County. Abstract furnished for examination. Write or wire Joe Milam, 516 Majestic Building, Oklahoma City, Okla.

— NORTHWEST —
THE EMPIRE OF OPPORTUNITY
The last great market, immune from competition, proration and overproduction; with geological conditions indicating next important fields. A project unique and inviting is open to desirable financial interests, on the ground floor of development with NORTHWEST OIL RESEARCH CORP., Box 689, Wenatchee, Washington.

MT. PLEASANT MICH. OIL FIELDS
500 acres, Sect. 7, Chippewa Twn., Isabella County. Attractive proposition to Co. or individual who will finance a well. E. Bacon, 13166 Monte Vista, Detroit, Mich.

IT PAYS YOU to buy choicest East, South Texas oil leases in good play ahead of "big strikes." $4 acre up. Good salesmen wanted everywhere. Also large ranches wanted to exchange for choice city property. Box 1662, Fort Worth, Tex.

NEW WOODBINE Field, East Texas, expected shortly, chance to make 40 to 1. Write E. Croft, Proctor, Tex.

YALOBUSHA COUNTY, Miss., 10,000 acres seven-eighths leases, 3,500-ft. well. Best geology. 10 mos. free. 25-cent rentals. OIL, Box 1260, Tulsa, Okla.

FOR SALE—2,500-acre oil lease adjoining leases owned by Major Oil Cos. Address Box 253, Texas City, Tex.

NEW MEXICO Oil Leases, Lands and Royalties. Free State Map and information. Roy G. Barton, Clovis, New Mex.

LOOK HERE
Red River and Bowie County
All kinds of leases and royalties, from one acre to drilling blocks, write, wire or call on
Caldwell-Crawford & Company,
Clarksville, Tex.
30 years' operation in the two counties.

GEOLOGICALLY selected drilling blocks. No bonus. No fees. Nicolle, Box 903, Houston, Tex.

A PRICE THAT TALKS OUT LOUD!

7¢ 5¢ 3¢

BRIDGEPORT CABLE BITS AT HALF THE COST OF RAW MATERIAL

A heavy overstock and light demand compels us to offer these Astounding Prices on NEW Bridgeport Cable Bits.

BRIDGEPORT'S HIGHEST QUALITY BITS MADE OF THE FINEST STEEL OBTAINABLE-PERFECT DESIGN-LONG LENGTHS-WORKMANSHIP AND MATERIAL POSITIVELY GUARANTEED.

Even a half day's fishing job will now cost more than a new bit. Don't take a chance with a short bit—one that has had the pin turned on several times, or one of unknown quality that may be crystallized when you can buy new, highest quality Bridgeport Bits at these astounding prices.

Just think, a set of two of our new, 5 3/16" bits cost you only about $38.00; a 15½" new bit costs you only about $75.00. Study carefully the table of sizes and prices below—then SEE YOUR NEAREST BRIDGEPORT STORE FOR YOUR BIT NEEDS.

Size	Pins	Collar Diameter	Approximate Length Over All	Approximate Weight Each	Price Per lb
5 3/16"	2"x3"	4¼"	7' to 7'8"	246lb to 276lb	7c
6¼"	3½" also 3¼"	4½" also 4½"	8' to 8'1"	401lb to 416lb	
6¾"	3¾"	5¼"	7'5" to 8'2"	421lb to 466lb	
8¼"	4¼"	6¼"	7'8" to 8'	700lb to 860lb	5c
10"	4"x5"	7"	7'8" to 8'	1078lb to 1210lb	
12¾"	4"x5"	7"	7'1" to 8'	1365lb to 1635lb	3c
15½"	4"x5" also 4¼"x6"	7" 8¼"	7' to 7'10"	1990lb to 2434lb	
18"	4"x5" also 4¼"x6"	7" 8¼"	6'10" to 7'	2186lb to 2810lb	

All Used Bits—Sizes 5 3/16"—6¼"—6¾" at 3c Per Lb. All Used Bits—Sizes 8¼" to 18" at 2c Per Lb.

Above prices f. o. b. your nearest Bridgeport Store Point.

BRIDGEPORT MACHINE COMPANY
Wichita, Kansas

Branches Conveniently Located in All Active Mid-Continent Oil Fields

Index to Advertisers

A
Air Reduction Sales Co. .....
Allis-Chalmers Mfg. Co. .....
Allsteel Products Mfg. Co. .....
American Cable Co., Inc. 4
American Meter Co. 1
American Steel & Wire Co. .....
Armstrong Machine Works .....
Ayer & Lord Tie Co. .....

B
Barnsdall Refineries, Inc. .....
Barrett Co., The .....
Barret, William M., Inc. .....
Bethlehem Steel Co. .....
Bignall & Keeler Machine Works. 2
Black, Sivalls & Bryson, Inc. .....
Bradford Motor Works, Inc. .....
Brewster Co., Inc., The 17
Bridgeport Machine Co. 62-104
Brown Instrument Co. .....
Burrell-Mase Engineering Co. ... 81
Byers, A. M., Co. .....
Byron Jackson Co. .....

C
Caterpillar Tractor Co. .....
Chaplin-Fulton Mfg. Co., The ... 51
Chapman Valve Mfg. Co., The .....Inside Front Cover
Chicago Bridge & Iron Works ...
Cities Service Co. .....
Classified Advertising 103
Cleveland Trencher Co., The .....
Continental Supply Co., The 32-A
Crane Co. .....

D
Darling Valve & Mfg. Co. .....
Dart, E. M., Mfg. Co. .....
Davis Regulator Co. .....
Dearborn Chemical Co. .....
De La Vergne Engine Co. .....
De Vine, J. P., Mfg. Co., Inc. ....
Dixon, Joseph, Crucible Co. .....
Dresser, S. R., Mfg. Co. 19

E
Eagle-Picher Lead Co. .....
Emsco Derrick & Equipment Co...
Ethyl Gasoline Corp. 40-41
Exchange Banks of Tulsa .....

F
Fischer, C. A., Co. 76
Fisher Governor Co. .....
Flexible Steel Lacing Co. .....
Foster Wheeler Corp. .....
Foxboro Co., Inc., The .....
Frick-Reid Supply Corp. 64

G
Garlock Packing Co., The .....
Gasoline Products Co., The .....
Gaso Pump & Burner Mfg. Co. ....Inside Back Cover
General Electric Co. .....
General Paint Corp. .....
Goodyear Tire & Rubber Co. .....
Gott, H. P., Mfg. Co., Inc. .....
Graver Tank & Mfg. Corp. 51
Gray Processes Corp., The .....
Guiberson Corp. .....
Gulf Refining Co. 56

H
Halliburton Oil Well Cementing Co. 99
Hazard Wire Rope Co. .....
Heeter, C. M., Sons & Co. 81
Highland Iron & Steel Co., The...
Hope Engineering Co. .....
Hough, Charles N., Mfg. Co. ....
Hughes Tool Co. .....Back Cover
Humble Oil & Refining Co..... 95

I
International Harvester Co. of America .....

J
Jarecki Mfg. Co. .....
Jenkins Bros. .....
Jerguson Gage & Valve Co. .....

K
Kellogg, M. W., Co., The .....
Kennedy Valve Mfg. Co., The ....

L
Landis Machine Co., Inc. .....
Layne & Bowler Co. .....
Lincoln Electric Co. .....
Linde Air Products Co. .....
Lummus Co., The .....
Lunkenheimer Co., The .....

Mc
McClintic-Marshall Corp. .....
McIntosh & Seymour Corp. .....
McKee, Arthur G., & Co., ...

M
Macwhyte Co. .....
Magnolia Petroleum Co. 3
Maloney Tank Mfg. Co. ..... Front Cover
Metric Metal Works 1
Midwest Piping & Supply Co., Inc. .....
Mission Sales Co. .....
Moore, Lee C., & Co., Inc. .....
Munn & Co. 81

N
National Supply Co. 48
National Transit Pump & Machine Co. 97
National Tube Co. .....
Naylor Pipe Co. .....
Neilan Co., Ltd. .....

O
Oakite Products, Inc. .. ..
Oil Conservation Engineering Co. . 81
Oil Well Supply Co. .....

P
Page Fence Ass'n .....
Page Steel & Wire Co. .....
Parkersburg Rig & Reel Co., The
Penberthy Injector Co. .....
Petroleum Equipment Co. .....
Petroleum Rectifying Co. .....
Pittsburgh-Des Moines Steel Co....
Pittsburgh Equitable Meter Co...34-35
Pittsburgh Steel Co. .....
Powell, William, Co. .....
Pure Oil Co., The 53

R
Reading Iron Co. .....
Reading-Pratt & Cady Co., Inc. ..
Regan Forge & Engineering Co....
Reid, Joseph, Gas Engine Co. ...
Republic Steel Corp. 43
Roebling's, John A., Sons Co. ....
Rohm & Haas Co., Inc. .....
Ross-Meehan Foundries Co. 76

S
Shell Union Oil Corp. .....
Smooth-On Mfg. Co. 51
South Chester Tube Co. .....
Spang, Chalfant & Co., Inc. .....
Sperry-Sun Well Surveying Co.... 55

T
Taylor Forge & Pipe Works .....
Texas Electric Service .....
Timken Roller Bearing Co., The..
Toledo Pipe Threading Machine Co. 76
Tretolite Co. 46
Trimont Mfg. Co. 79
Tube Turns, Inc. .....

U
Union Wire Rope Co. .....
United North & South Development Co. 6
Universal Oil Products Co. 15

V
Vellumoid Co., The .....
Vogel, Felix A. .....
Vogt, Henry, Machine Co. .....

W
Wailes Dove-Hermiston Corp. ...
Wickwire Spencer Steel Co. .....
Williamsport Wire Rope Co. 71
Winkler-Koch Engineering Co., The
W-K-M Co., Inc. .....
Worthington Pump & Machinery Corp. .....

Y
Young Engine Corp. .....
Youngstown Sheet & Tube Co., The 32-A, 32-B